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Magnetic Resonance in the Diagnosis of C.N.S. Disorders
Vaso Antunović, Gradimir Dragutinović, Zvonimir Lević, and Miroslav Samardzić, eds. Stuttgart, Germany: Thieme, 2002. 317 pages, 330 illustrations, $129.

Magnetic Resonance in the Diagnosis of C.N.S. Disorders is composed of two main sections, brain and spine, for a total of 317 pages. Each section starts with a chapter on general principles and then offers 14 chapters related to brain pathology, including the craniocervical junction, and nine chapters related to spine and spinal cord pathology. The book contains 330 figures intermixed with text. Nine editors and authors contributed to this book. Most authors are from the field of neurosurgery, and all are affiliated with the Clinical Center of Serbia School of Medicine at the University of Belgrade in Yugoslavia. In the minority, one of the authors is a radiologist and one is a neurologist.

The stated intent of the authors, as outlined in the Introduction, is to describe how the addition of MR imaging to the field of medicine has contributed to the assessment, diagnosis, and management of a wide range of neurologic and neurosurgical disorders. The authors review the use of MR imaging in conjunction with the clinical findings of patients in their practice to show the importance of MR imaging.

The emphasis of the book is on the figures, which are large and occupy perhaps half of the volume of the book. There are several major problems with the figures and figure legends. The first relates to the variety of imaging sequences. Having read this book, I now realize that I have taken for granted the vast array of sequences and quality of the images I read on a daily basis, not just from our institution but from outside centers as well. The sequences used in this book include spin-echo T1-weighted, spin-echo proton density-/T2-weighted, gradient-echo T2-weighted, and contrast-enhanced T1-weighted sequences only. There is no discussion or use of fluid-attenuated inversion recovery or diffusion imaging, which have become commonplace in the United States, and certainly no discussion of perfusion, functional imaging, or spectroscopy, which are less commonly found techniques. A short chapter on MR angiography is presented, with little discussion of the use of this technique in other chapters, and no MR angiograms are shown throughout the general text. A chapter on cerebrovascular disease of the brain should include a discussion and figures showing the contribution of MR angiography to diagnosis and case management.

Second, the quality of the figures is poor, particularly the spine images. This is perhaps because of a combination of outdated imaging and poor reproduction. Figures are presented in which the pathologic abnormality of the spinal cord cannot be seen despite the addition of an arrow pointing to the abnormality.

An additional problem with the figures and figure legends is the editing. Poor editing runs throughout the figure legends and starts in the first chapter, where a figure legend describes an image as T1-weighted when a T2-weighted image is shown. Arrows are missing from several figures, the word *density* is used instead of *intensity*, and legends are inappropriately matched with figures. Later in the text, a coronal view image of the brain is printed upside down.

Also, image cropping is poor. Not only do most images contain small bites of technical information in the periphery of the images that should have been cropped or otherwise eliminated, but many of the images contain patients' last names and years of birth. In some cases, this may be enough information to identify a patient and could constitute a dramatic breach of patient confidentiality. Many of the images also include the dates on which the studies were performed, revealing numerous images that were obtained in the years 1990 or 1991. This explains, in part, the poor quality of the images, taking into account the remarkable advances that have occurred in the field since the early 1990s. When I review images obtained at our institution during the early 1990s, I note that the image quality is poor compared with today's standards.

In general, the text is adequate but often incomplete. The chapter on brain malformations states that anomalies of cell migration are "extremely rare and seldom reported in the literature" without further differentiation of the various anomalies or related figures. Pathologic entities involving the brain or spine are described by their T1 and T2 characteristics without discussion of how to differentiate one disorder or tumor from another. No discussion is offered regarding the basics of intra-axial versus extra-axial masses or intramedullary versus intradural-extramedullary or extradural masses. The reader may finish the text being able to generate a differential diagnosis but unable to differentiate the entities. For instance, a small subsection on neurofibromatosis does not describe the differences between neurofibromatosis 1 and neurofibromatosis 2 nor does it discuss the MR imaging findings of either of these entities aside from a figure labeled "Neurofibromatosis" showing bilateral acoustic schwannomas.

Although tuberous sclerosis and neurofibromatosis are discussed under the subheading of phakomatosis, no discussion of Sturge-Weber syndrome or von Hippel-Lindau syndrome is presented. Also, no discussion is offered of the vascular distributions of infarcts, the differences in arterial versus venous infarcts, or the various appearances of hemorrhage on T1- and T2-weighted sequences based on age of blood products. Hemorrhage is described only as high on T1- and T2-weighted sequences.

The authors also describe vein of Galen malformations as having "not been visualized yet by neuroimaging methods," and venous angiomas as "rarely seen." In fact, vein of Galen malformations can be imaged with sonography, conventional angiography, CT, or MR imaging and venous angiomas (developmental venous anomalies) are commonly seen on contrast-enhanced MR images.

There is a small subsection on neuro-AIDS which perhaps deserves its own chapter, without discussion of the differentiation of HIV encephalitis versus progressive multifocal leukoencephalopathy, toxoplasmosis versus lymphoma, etc. The sole figure related to AIDS describes T2 hyperintensities as "multiple AIDS lesions."

Clinical indications for MR imaging are included in each chapter but are dramatically different from what would be considered reasonable indications for MR imaging in the United States. For instance, the role of MR imaging in cerebrovascular diseases is described as useful in subacute or chronic conditions but does not include the important role MR imaging now plays in the acute diagnosis of stroke. Neuroimaging is described as "of purely academic importance for patients" with clinically definite multiple sclerosis, even though it is commonplace in the United States and elsewhere to use MR imaging in conjunction with clinical symptomatology and laboratory analysis to diagnose multiple sclerosis and to follow therapeutic response to various treatments.

Each chapter includes a discussion of the neurologic signs and symptoms with which patients may present and often a discussion regarding the neurosurgical approach to the patient that is valuable. For instance, in the subsection on aneurysms, the authors include the Hunt and Hess clinical grading of patients with subarachnoid hemorrhage, often discussed among neurosurgeons and angiographers but difficult to find in a general radiology or neuroradiology text.

References are included at the end of each chapter. Most references are from the 1980s, with very few references from the 1990s. The index is short but inclusive and easy to use.

In summary, the book is outdated in its use of what I consider to be standard current neuroimaging techniques, the image quality is substandard, and some of the figures contain a possible breach of patient confidentiality. There are too many editing errors involving the figures and figure legends for this book to be of use to physicians in training or clinicians unfamiliar with MR imaging. The text contains an incomplete discussion of pathologic entities often revealed by MR imaging and lacks description of basic MR imaging findings. Indications for the use of MR imaging are also, for the most part, not applicable in the United States. I do not recommend this text as a standard book on radiologists' shelves or to clinicians who are interested in an updated review of MR imaging of the CNS.