

Book Reviews

INTERACTIVE IMAGE-GUIDED NEUROSURGERY. 1994. Edited by AANS Publications Committee, Robert J. Maciunas (ed.). Published by The American Association of Neurological Surgeons. 278 pages. \$C117.00

This book is one in the series of excellent volumes entitled "Neurosurgical Topics" published by the AANS. This book reviews the current status of Interactive Image-Guided Neurosurgery (IIG), also known as frameless stereotaxy. On reviewing the list of contributors, the multidisiplinary nature of this particular subject becomes evident. The areas of engineering, physics, radiology, radiation oncology, computing science and neurosurgery are authoritatively represented.

The chapters are organized into five sections. The first discusses the "Fundamentals". The history of stereotaxy and the development of frameless stereotaxy is reviewed. Dr. Maciunas compares the term frameless stereotaxy to the "horseless carriage" thus emphasizing the need for the more comprehensive concept described as, "Interactive Image Guided Surgery". This section also reviews the basic concepts of registration, reformatting and rendering. These are the means by which the imaging data can be manipulated and ultimately mapped to points in the physical space of the operating or treatment field.

The second section elaborates on the concept of image registration with detailed chapters reviewing the coregistration of multiple imaging modalities such as PET and MRI and the linkage of imaging data with anatomical landmarks. The third chapter in this section outlines the use of IIG in radiosurgery.

The third section describes the various prototypes that have been developed including the ISG wand. Dr. James Drake thoughtfully compares the wand to a robotic system finding the former more useful. Given the diverse range of instrumentation being developed, each with its own strengths and weaknesses, this type of analysis will be critical in determining which technology will eventually survive.

The fourth section deals with the main criticism of IIG, that is, the imaging data is static, yet the structures in the operative field may shift. To circumvent this problem, the use of intraoperative CT, ultrasound, endoscopy and electrophysiological data are strategies discussed, both as independent modalities and in conjunction with stereotactic systems. The use of real time intraoperative MRI is not reviewed.

In the only chapter of the final section, Dr. Maciunas and others describe the disparity of mechanical or theoretical accuracy of a system and the actual application accuracy. They discuss the use of implanted fiducials which could improve the precision of frameless systems.

This book does suffer from some repetition particularly historical information and basic concepts. Some chapters are highly technical and read like a mathematics textbook. Despite these shortcomings, this book is well formatted and provides a comprehensive review of a very exciting and rapidly evolving technology. Accurate localization of intracranial targets is a challenge for all neurosurgeons, therefore, I think this book will be of some interest to all neurosurgeons and residents. It will appeal primarily to stereotactic neurosurgeons and to those who are planning to develop or eventually acquire a system for their institution.

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MIGRAINE: MANIFESTATIONS, PATHOGENESIS, AND MANAGEMENT. 1994. By Robert A. Davidoff. Published by F.A. Davis Company, Philadelphia. 375 pages. \$C111.00

There are already enough books available on headaches in general and migraine in particular that any newcomer must be met with the query, "Why yet another?". Happily, this monograph on migraine need make no apologies, for many good reasons. Among these are organization, comprehensiveness, expertise, literacy, and helpfulness.

As one might expect of the creation of a classically trained neurologist, Davidoff's book is a model of logical organization; this, in conjunction with a compulsively complete index, makes it easy to find things. Part I begins with a chapter on the epidemiology of migraine, followed by chapters on triggers, on clinical manifestations, on examination and investigation, and on differential diagnosis. Throughout, one can sense the authority of a seasoned clinician.

Part II, Pathophysiology, is clearly written and helpfully illustrated, and provides a comprehensive and comprehensible overview of a complex subject. As a minor fault, the most recent references in this fast-moving field are no later than 1991, suggesting that there was a lag time of about three years in getting this book into print. Other publishers do better: Lance's book,¹ published the year before, cites a number of 1991 references in his chapter on migraine pathophysiology; and some of the migraine pathophysiology chapters in Olesen, Tfelt-Hansen and Welch's² tome of 1993 cite references from 1992 and even 1993. This lag should not be a problem, however, for the clinician who wants to better understand migraine, for while the shadings of migraine pathophysiology change fairly rapidly, the broad strokes fortunately do not.

Part III, Treatment, is complete, including discussions of drugs such as flunarizine and formulations such as oral sumatriptan, which are not yet available in the author's home country, the United States. Since both are marketed in Canada, this book is clearly more useful to Canadian clinicians than are those which restrict themselves to only those drugs available in their authors' own countries. The sections on analgesic-induced headaches, "chronic daily headaches", and headache treatment in the Emergency Room, all topics which bedevil the practicing neurologist, are sensible, sane and very helpful. The chapter on "Special Situations" is especially important for neurologists ... it deals with such diverse but troublesome areas as menstrual migraine, the pregnant migraineur, the migrainous child, and the elderly migraine sufferer.

The bibliography contains over twenty-two hundred references – an immense task for a single author, even for one widely known as an expert in computerization.

This book is volume 42 in the well-known Contemporary Neurology Series. Some other volumes in this series, such as Plum and Posner's "The Diagnosis of Stupor and Coma" and Leigh and Zee's "The Neurology of Eye Movements" have become classics. Davidoff's "Migraine" is a worthy addition.

References:

1. Lance JW. Mechanism and Management of Headache. 5th edition. Oxford. Butterworth Heinemann. 1993. 289 pages.
2. Olesen J, Tfelt-Hansen P, Welch KMA. The Headaches. New York. Raven Press. 1993. 894 pages.

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