DISORDERS OF NEURONAL MIGRATION
Edited by Peter G. Barth

As a young geneticist with a deep interest in neuropediatrics, I was pleased to be asked to review this recently published book. I hoped that it would bring me up to speed with current thinking about diseases that are not my specialist area of interest but are important for my routine practice. I was not disappointed.

Only since the advent of computed tomography (CT) in the 1970s, and in particular the large-scale introduction of magnetic resonance (MR) imaging in the mid-80s, have
neuronal migration disorders become a topic in daily clinical practice. Great strides have been made since then. Accordingly, developmental abnormalities of the well-ordered process of neuronal migration are known to be of many different origins, including exogenic and genetic causes. Given the impressive and fast-moving achievements made in the field of genetics, particularly during the last decade, striking new insights can be expected to emerge in the coming years. Thus, it may be hypothesized that an update of this text will be necessary in a couple of years. In the meantime this volume provides a valuable resource.

**Disorders of Neuronal Migration** is a short, readable text which follows a standard format. Different chapters are written by different authors. Inevitably there is some overlap caused by this, but this is not disturbing and from an educational point of view some redundancies may be useful. Ten chapters cover all aspects of this complex of disorders, and reflect the way in which the field has quickly moved forward in the last few years. It is enhanced by the fact that the authors of each chapter are recognized experts in their field, and thus the accounts are authoritative. While neuronal migration happens all over the central nervous system, a number of disorders linked to the embryonic migrational process in general had to be left out as this would have gone beyond the scope of this book. Thus, for practical reasons only neuronal migration disorders related to the human neocortex are presented. The book successfully links basic information on the process of neuronal migration with descriptions of abnormalities of this process in affected patients, including all its clinical implications. Overall, I think it presents a balanced view of our contemporary understanding of this fascinating area.

The book begins with a chapter on the basic science of the morphogenesis of the human cerebral cortex. These data are conveyed in a nice way, with an easily comprehensible figure showing the cell’s internal mechanisms underlying proliferative processes. One point to be criticized is that the calculations made by the authors are quite elaborate and could have been made much shorter. This chapter is followed by a clearly detailed consideration of the clinical and molecular genetic basis of lissencephaly. Just as other areas, the field of lissencephaly can be expected to be genetically more heterogeneous than currently known. Thus, further gene discoveries will make significant contributions to clinical syndrome delineation, genetic counselling, prenatal diagnosis, and the developmental biology of this field. Accordingly, the approved grading system for lissencephaly and subcortical band heterotopia might have to be revised with advancing exploration of the genetic basis of this fascinating complex of diffuse malformations of neuronal migration. The next section describes the non-lissencephalic cortical dysplasias in a very practical way, with clear and concise recommendations and statements of when surgical intervention may be helpful, depending on the severity and site of the malformation process. It is followed by chapters on periventricular grey matter heterotopias and callosal anomalies that largely benefit from the extensive clinical experience of the authors. This is apparent as one advances through the text. The authors do express some unambiguous views on the assessment and management of many disorders. As a direct consequence, this provides the reader with a clear and clinically relevant source of reference. The chapter on hemimegalencephaly is extensive and could have been dramatically shortened, whereas the closing remarks are very concise, providing the reader with helpful comments on the management of patients affected by this disorder. The next chapter, on schizencephaly, is written in a succinct and pertinent way that makes easy reading. There is then an excellent review of syndromic cortical dysplasias. The authors of this chapter had to cope with a wide variety of inherited disorders that include a neocortical neuronal migration disturbance as a minor or major part. They solved this challenge by splitting the section into a description of the putatively most important disorders and a table providing an extensive list of disorders, with multiple helpful topical subheadings. The penultimate chapter is devoted to polymicrogyria and the role of excitotoxic damage. The final section continues the practical theme with a review of fetal disruption as a cause of neuronal migration defects. In each chapter, the non-specialist is carefully negotiated through the field and the major conclusions are clearly presented, along with clear statements about what is known and not known about the disorder in question.

This book has a number of strong points. First, the right balance has been struck between length and depth. The chapters are generally short and well written. There is sufficient detail to make each section an interesting and enlightening read, but not so much as to make it indigestible. This book could be easily read late at night after a busy day in the clinic. The book’s second strength is its style, which is remarkably consistent throughout in spite of the number of different authors. The authors were not afraid to give a firm opinion, which may or may not be qualified with a reference to published evidence. This is a welcome approach and is not over-used. Of course, the views expressed in this book are based upon evidence, but for the relatively rare disorders of neuronal migration that are discussed, this evidence may be a personal case series acquired during a long and busy career rather than being based on many patients assessed by numerous independent observers. The frequency of personal communications and direct quotations, however, is well-balanced, and as a non-expert I found them very helpful and easy to put into clinical practice.

Although it is comprehensive in its scope, the book is relatively compact, and selling at £45 it offers excellent value for money. References are printed after individual chapters rather than together at the end of the book, and there is a well-organized index section. Tables thankfully complement the text rather than repeating it. The authors rightly place particular emphasis on brain imaging. Illustrations are of generally high quality and are annotated in detail, which helps to emphasize their message for the reader. Overall, this is an excellent, up-to-date book covering a wide spectrum of
neuronal migration disorders. It presents the information in an extremely readable and digestible form, offers very sound advice on diagnosis, the use of investigations and medical management, yet manages to remain accessible in size and cost for most busy clinicians. I would certainly recommend it to all paediatric neurologists, and also to other clinicians and scientists who are concerned with prenatal-onset neurological impairment, including geneticists, neurologists and paediatricians, and others interested in developmental disorders.

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