

Toshio Matsushima

Microsurgical Anatomy and Surgery of the Posterior Cranial Fossa

Surgical Approaches
and Procedures Based on
Anatomical Study

 Springer

Microsurgical Anatomy and Surgery of the Posterior Cranial Fossa

Toshio Matsushima

Microsurgical Anatomy and Surgery of the Posterior Cranial Fossa

Surgical Approaches and Procedures
Based on Anatomical Study

 Springer

Toshio Matsushima
Department of Neurosurgery
Faculty of Medicine, Saga University
Saga, Japan

This English translation is based on the Japanese Original “Kouzugaika no Bishougekakaibo to Shujyutsu” by Toshio Matsushima © SciMed Publications, 2006
Originally published in Japan in 2006

ISBN 978-4-431-54182-0 ISBN 978-4-431-54183-7 (eBook)
DOI 10.1007/978-4-431-54183-7
Springer Tokyo Heidelberg New York Dordrecht London

Library of Congress Control Number: 2014947536

© Springer Japan 2015

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Foreword

It is a great honor to have been asked to write the foreword to this text that brings order to one of the most complex areas the neurosurgeon faces. Neurosurgeons are fortunate to have access to this book by one of the world's great masters of posterior fossa surgery. This volume stands as a tribute to Dr. Matsushima's dedication to academic excellence and operative neurosurgery. Professor Matsushima has completed more than 40 years of intensive study of posterior fossa anatomy and has translated that information into accurate, gentle, and safe surgical approaches to this delicate area. I have learned much from his previous work and know that neurosurgeons around the world will benefit greatly from this volume. Dr. Matsushima presents a wealth of information in a concise, well organized format. This book provides a detailed review of the anatomy of the posterior fossa followed by descriptions of the operative approaches. I found the contents of this book to be interesting, enlightening, and beneficial even after decades of neurosurgical practice. Congratulations to Professor Matsushima, one of the world's greatest authorities on the posterior fossa, for this outstanding contribution. The study of this volume will make the neurosurgeon's work more accurate, gentle, precise and safe.

Gainesville, FL, USA

Albert L. Rhoton, Jr., M.D.

Foreword

I would like to congratulate that this book, originally published in Japanese, is now available in English to benefit neurosurgeons worldwide. It is a compilation of many years' work by Dr. Toshio Matsushima, focusing on the microsurgical anatomy of the posterior fossa.

Dr. Matsushima began his neurosurgical career at Kyushu University, Japan in 1974, and was one of the pioneering researchers to study abroad at Dr. Albert L. Rhoton's laboratory at the University of Florida in 1980. His passion for microsurgical anatomy was inspired by his mentor Dr. Rhoton's work during his time at Gainesville, and he has continued to pursue this subject ever since.

After returning to Kyushu, he continued his work on microsurgical anatomy, exploring the many challenges and issues he confronted in his clinical neurosurgical practice. This time roughly coincided with the period of the rapid development of microneurosurgery around the world including Japan. Throughout these critical years, he maintained a close relationship with Dr. Rhoton, sending a stream of excellent young neurosurgeons from Kyushu University to study at Rhoton's laboratory, where they contributed greatly to the field, producing numerous publications. I consider Dr. Matsushima to be one of the most influential figures in the field of microneurosurgical anatomy, along with Dr. Evandro de Oliveira from São Paulo, who have helped Dr. Rhoton develop this new field over the past several decades and spread their knowledge to the world.

Dr. Matsushima endeavored to found the Society of Microneurosurgical Anatomy in Japan in 1986. The Society's annual meeting is counting its 28th anniversary, with its contents published as a book every year. In 2002, Dr. Matsushima partnered with Dr. Rhoton as Co-President to organize the first International Symposium on Microneurosurgical Anatomy in Matsumoto, Japan; the symposium has since been held 4 times in locations around the world.

His fields of interest cover a broad range of neurosurgery, and he has been especially keen in microsurgical anatomy and surgical approaches to the posterior fossa. His initial work focused on the venous system of the posterior fossa including the venous sinuses of the tentorium. Understanding the anatomy of the venous system including collaterals and variations is important to avoid postoperative complications, especially as we do not have effective means to monitor venous circulation. As for surgical approaches, I believe his naming of the trancondylar fossa approach is the most appropriate among other proposed terminologies. Additionally, his proposal of a transcerebellomedullary fissure approach to the fourth ventricle, as well as the infraorbital approach to the root exit zone of the seventh cranial nerve are among his most important research contributions.

Because the posterior fossa represents a relatively small volume confined within the skull that includes numerous vital structures such as the brainstem, cranial nerves, and arteries, surgical approaches are very difficult. One of my interests has also been the posterior fossa, and I was once involved in the study of the Nervus intermedius with Dr. Rhoton at the Mayo Clinic in the late 1960's before he moved to Gainesville; we wrote a paper on the nerve. This inspired me to take up vestibular schwannoma surgery as one of my career specialties.

I highly recommend this unique and condensed book on microneurosurgical anatomy and surgical approaches of the posterior fossa to neurosurgeons wishing to accomplish accurate and safe operations for various posterior fossa lesions.

Matsumoto, Japan

Shigeaki Kobayashi, M.D.

Foreword

This anatomical book on “*Microsurgical Anatomy and Surgery of the Posterior Cranial Fossa*” published by Toshio Matsushima is a magnificent complement to the study and comprehension of the posterior fossa.

In this book Toshio shows a clear vision of all his experience and the importance of the microanatomy in the neurosurgery.

This issue not only presents an excellent anatomical material as well as correlated with the RM/CT images and surgeries.

This is a super work and certainly an extraordinary support to residents or senior neurosurgeons.

Now published in English it can be read for all around the world. I have no doubt that it will be of a great importance for all levels of clinical and neurosurgical practices.

São Paulo, SP, Brazil

Evandro de Oliveira, M.D.

Foreword

It is a great pleasure and honor to write this foreword to Dr. Matsushima's outstanding textbook that gives us a unique insight into the posterior fossa anatomy. First the book was written in Japanese in 2006. Now this book, which he revised, added three chapters to, and translated into English, is dedicated to the surgical anatomy of the posterior fossa and surgical approaches to this region.

The great number of color photographs and artistic illustrations show countless anatomical details of the skull base, the vascular patterns, the cerebellum, the brainstem, and its nerve rootlets. This work not only demonstrates Dr. Matsushima's scientific approach to this topic, which he started under the guidance of his teacher and great master, Dr. Albert L. Rhoton Jr.; it also reflects his decade-long dedication to the subject and his love for anatomical details that have made Dr. Matsushima become a world-leading expert in this field and that are so important for all neurosurgeons who treat patients with various posterior fossa pathologies. The concise but very comprehensive way the most important surgical approaches to the posterior fossa and craniocervical junction are described render this work one of the most important reference books that are presently available. Dr. Matsushima's book may not only inspire young neurosurgeons who are learning how to operate in the posterior fossa region; I am convinced that it offers even very experienced neurosurgeons a number of anatomical and strategic details that they may not have been aware of before reading this book. I wish to congratulate Dr. Matsushima for sharing his vast experience with all neurosurgeons by providing us such a wonderful and stimulating textbook.

Hannover, Germany

Helmut Bertalanffy, M.D.

Preface

I clearly remember the moment when I became very excited in Prof. Albert L. Rhoton's lab at the University of Florida in July 1980. It was when I first dissected and observed an autopsied specimen through the operating microscope. This followed my realization of how important it was to have a knowledge of microsurgical anatomy after the unsuccessful surgery I had experienced 4 years before.

In those days no CT scans were performed at most city hospitals, and brain tumors were diagnosed only by angiography. I was a third-year resident and was too young to be afraid of anything. Even with a senior surgeon in attendance, I operated on a child patient with a fourth ventricular ependymoma but failed to remove most of the tumor. As a result I had to request that a second surgery be done at the university hospital. It became an unforgettable bitter memory in my life.

For the 34 years since then, I have spent a good part of my life on the study of microsurgical anatomy in order to perform safe and accurate surgeries. Hoping that young Japanese neurosurgeons would be able to study surgical anatomy and surgeries quickly and easily, I published a textbook entitled *The Microsurgical Anatomy and Surgery of the Posterior Fossa* in Japanese in 2006.

Thanks to the suggestions and encouragement from Prof. Rhoton as well as from some friends, I decided to make an English translation of that book.

Now, with the help of assistants, I have revised and translated the Japanese book into English. I hope that many neurosurgeons, including those outside Japan, will be able to easily acquire the anatomical knowledge of the posterior fossa related to surgeries, and that many patients will be able to receive safe and accurate surgeries based on sufficient knowledge.

I would like to express my deep gratitude to Prof. Albert L. Rhoton at the University of Florida for giving me the opportunity to study microsurgical anatomy and for his valuable, long-time guidance. I also thank Ms. Takako Shiga and Ms. Yumiko Ohishi for assisting in preparing the manuscript and illustrations, and the staff of the Enago Company for editing the English in my manuscript. Last but not least, I would like to express my appreciation to the last Professor Emeritus Katsutoshi Kitamura (Kyushu University) for first teaching me the importance of surgical anatomy and giving me continuous encouragement for many years.

I dedicate this book to my beloved family, who have long supported me.

Saga, Japan

Toshio Matsushima, M.D.

