

Tumors of the Jugular Foramen

Ricardo Ramina
Marcos Soares Tatagiba

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Ricardo Ramina, MD, PhD
Chairman of the Neurosurgical Department
Neurological Institute of Curitiba
Curitiba, Brazil

Marcos Soares Tatagiba, MD, PhD
Chairman of the Neurosurgical Department
Eberhard Karls University
Tübingen, Germany

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*This book is dedicated to our patients.
Every patient teaches us something.
Something that we are ought to use
to help new patients.*

Foreword

The jugular foramen is a special anatomical area of the skull base. It contains the jugular bulb and the vein and the lower cranial nerves 9, 10, and 11. In addition, the cranial nerves 12, and 7, the petrous internal carotid artery, the spino-medullary area, and the cerebrospinal fluid containing intradural space lie close to it. The bony and cartilaginous structures of the cranio-cervical junction also lie in the vicinity.

Because of the importance of the jugular vein (particularly when it is dominant), the lower cranial nerves, and the critical structures which are nearby, surgery of lesions involving the jugular foramen is complicated, and fraught with morbidity, which may lead to major disability or death. Due to this reason, lesions of this area should be treated in specialized centers and by experienced surgical—endovascular—intensive care teams. Such lesions include neoplasms such as paraganglioma, meningioma, chordoma, chondrosarcoma, schwannoma, and metastatic malignancies; dural arteriovenous fistulas; spontaneous thrombosis and stenosis of the jugular bulb; and traumatic lesions.

Professor Ricardo Ramina and his colleagues from Brazil have developed a special expertise in the treatment of lesions of this area, as reflected by their experience in surgically treating 163 patients. They have achieved international prominence for this surgery and are recognized all over the world for their innovations and expertise. This extensive experience has been translated by them into this monograph, which is focused on the tumors of the jugular foramen.

This book is divided into 13 chapters. These chapters address topics such as historical aspects; epidemiology, genetics, and pattern of spread; surgical anatomy; radiology; evidence-based treatment; preoperative embolization; surgical treatment and postoperative management; clinical examples and videos of individual cases; radiotherapy; pathology; chemotherapy; and surgical results and rehabilitation.

Each chapter is very well written, easy to read, and has an abstract which outlines the points contained in the chapter. The figures, illustrations, and videos are excellent and add greatly to the quality of this book.

It would be very difficult for any one team to accumulate such an extensive experience and expertise in the management of jugular foramen tumors. All young surgeons and surgical teams who are involved in the care of these tumors must read this book. Even surgeons with experience in this area will gain a lot from reading this book.

I congratulate Professor Ramina and his team for producing this excellent book. I am sure that they have labored for countless hours in writing this book, not to mention the experience and expertise accumulated in treating these lesions.

Seattle, WA, USA

Laligam N. Sekhar , MD, FACS, FAANS
William Joseph Leedom and Bennett Bigelow
and Leedom Professor,
Director Cerebrovascular and Skull Base Surgery
Department of Neurological Surgery
University of Washington

Foreword

It is with great pleasure that I write this preface for the book *Tumors of Jugular Foramen*. It brings me not only joy but also pride that the authors of this book are two of my best pupils who have both reached highest degrees of expertise in the management of skull base surgery in the school where I developed a new surgical philosophy together with my late friend Wolfgang Draf in the 1960s and 1970s.

Among all skull base approaches, the surgery of the jugular foramen triggered a special interest in me due to the high rate of morbidity and, in some cases, mortality. Solving the problems of existing surgical approaches to the jugular foramen was a great challenge, especially at a time when there were no sufficient diagnostic tools, no CT or MRI was available, and no embolization techniques were developed. I recall operating a giant vascular jugular foramen tumor with extreme intra- and extracranial extensions with no option of preoperative embolization. We achieved total removal with good postoperative results in a surgery that lasted 24 h!

Through the years, we have achieved more precise diagnoses with the help of CT and MRT and selective angiography. I am thankful to Anton Valavanis who developed a very sophisticated and safe embolization technique for the reduction of blood supply to the tumors such as large glomus jugulars with enormous vascularization. The intraoperative monitoring introduced for cranial nerves has become a routine procedure in every case.

The continuous cadaver study of anatomy has taught us many possible anatomical variations, and simultaneously we have had a learning curve for the surgical anatomy of different types of pathologies. We have not only extended our abilities in radical tumor excision but have also managed to avoid possible morbidities particularly through different biological behavior of tumors.

There is no doubt that the jugular foramen region is still a challenging region of the skull base from a surgical point of view. All those neurosurgeons and ENT surgeons wanting to deal with the surgical treatment of all pathological entities of the jugular foramen need to learn the exact surgical anatomy, natural history of different tumors, and all possible morbidities.

I am thankful to Ricardo Ramina and Marcos Soares Tatagiba for their efforts in gathering and collecting all existing knowledge about the historical aspect of surgical development, epidemiology, genetic and natural history, clinical symptoms, different classifications, surgical anatomy, indication of conservative and surgical treatments including radio- and chemotherapy, preoperative embolization, and post-operative management. A special chapter is dedicated to surgical results and rehabilitation. With clinical illustrations of various cases and video demonstrations, this book facilitates the understanding of the very complex surgical approaches and the details of the challenging steps of the surgery.

My personal advice to current and future generations of skull base surgeons is

SURGICAL RESULTS SHOULD BE BETTER THAN NATURAL HISTORY OF THE PATHOLOGY.

I would like to congratulate Ricardo Ramina and Marcos Soares Tatagiba for their achievement, publishing such a valuable document for coming generations. This book is another contribution to the further development of skull base surgery.

Hannover, Germany
July 2016

Madjid Samii, MD, PhD
President of the International Neurosciences
Institute of Hannover (INI)

Preface

Jugular foramen tumors, once considered to be one of the most difficult skull base lesions to be resected, are now becoming manageable with reasonable morbidity and mortality rates. These lesions are deeply located and involve highly complex neurovascular structures. A plethora of pathological conditions are encountered in this region. The recent achievements in neuroradiology, molecular biology, and genetics have contributed to a better understanding of the natural history and biological behavior of these tumors. The innovations in computed tomography, magnetic resonance imaging, and digital subtraction angiography have increased our ability to diagnose and delineate the extension of the disease. The well-coordinated multidisciplinary surgical approach to these challenging tumors, added to the parallel advances in the fields of interventional neuroradiology, neuroanesthesiology, neuroelectrophysiology, and neurointensive care, has revolutionized the management of these lesions. In spite of all these achievements, surgical removal of jugular foramen tumors remains a challenge for neurosurgeons and ENT surgeons. Therefore, multimodal treatment that includes radiotherapy or radiosurgery, as well as chemotherapy in selected cases, will complete the armamentarium to manage these complex lesions.

This book attempts to address the issues of historical aspects, epidemiology, surgical anatomy, diagnosis, surgical techniques, and postoperative management of these tumors. The results of a series of surgically treated patients and clinical examples as well as videos of the surgical technique are presented.

We would like to acknowledge the masters in skull base surgery who have had a personal influence on our career: Dr. Madjid Samii, neurosurgeon, and Dr. Wolfgang Draf, ENT surgeon, whose teaching, encouragement, and thoughts stimulated us to manage the most challenging lesions at skull base.

Curitiba, Brazil
Tübingen, Germany

Ricardo Ramina, MD, PhD
Marcos Soares Tatagiba, MD, PhD

Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love what you are doing or learning to do. Pelé—Brazilian most successful soccer player, three-time World Cup Champion, considered by many to be the greatest soccer player of all time.

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It is a genuine pleasure to express my deep sense of thanks and gratitude to Prof. Dr. João Jarney Maniglia for his dedication, inspirations, and sharing with me his ENT surgical expertise, during the several hours we have spent operating the most complicated jugular foramen tumors.

To Roberta Braga, thank you for encouraging me with this project and still loving me even when I could not dedicate any time to you while researching and writing this book.

Contributors

Gustavo Jung Neurosurgical Department, Neurological Institute of Curitiba, Curitiba, Brazil

Gustavo Nogueira Chairman of the ENT-Surgery Department, Neurological Institute of Curitiba, Curitiba, Brazil

Leonardo Ruschel Neurosurgical Department, Neurological Institute of Curitiba, Curitiba, Brazil

Luiz Fernando Moura da Silva Jr Neurosurgical Department, Neurological Institute of Curitiba, Curitiba, Brazil

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