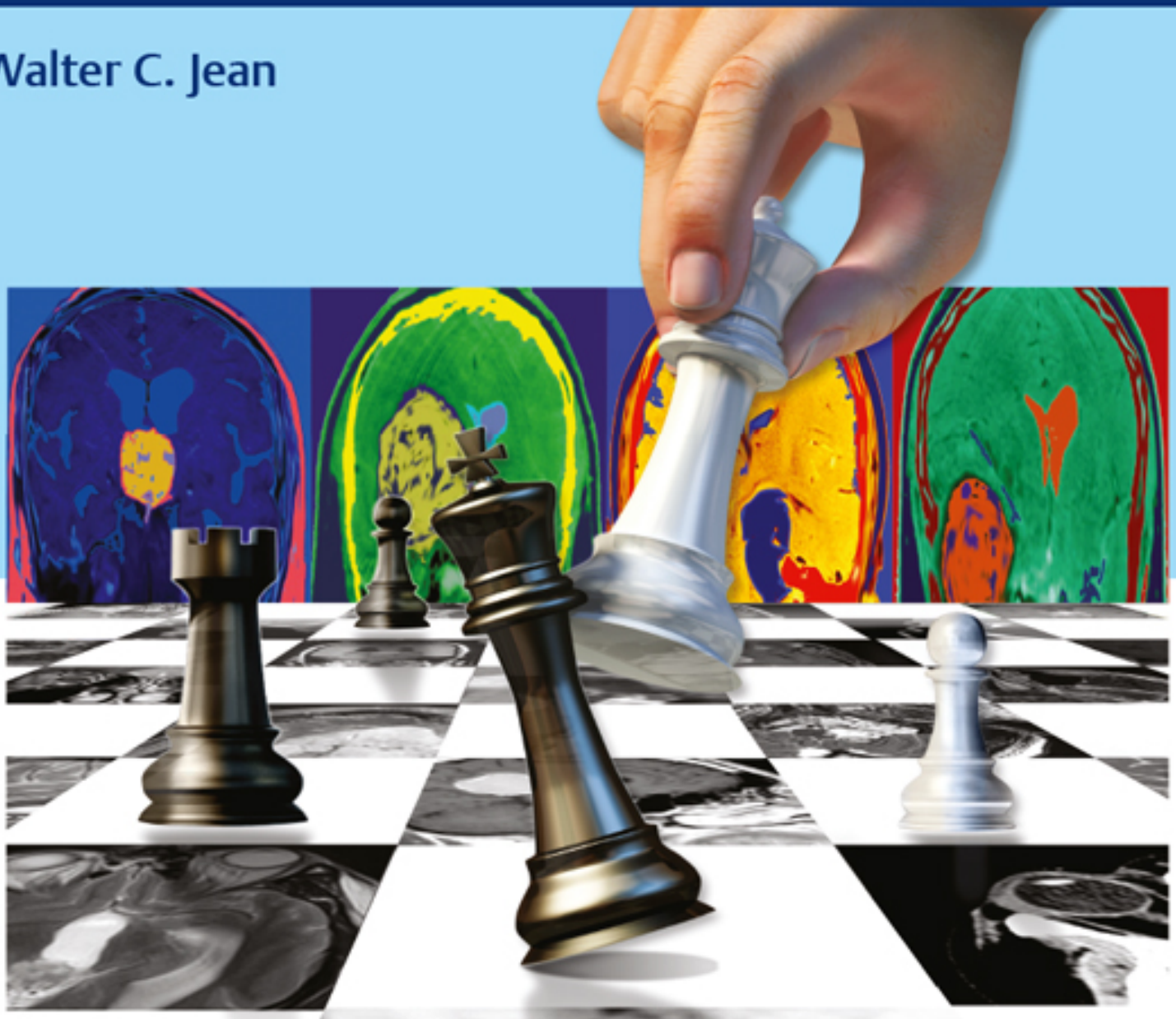
Skull Base Surgery: Strategies

Walter C. Jean



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Skull Base Surgery: Strategies

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To my mother

Dora Chu Jean
1941-1996

a lifetime dedicated to the education of her son

Contents

Part IV Tumors of the Central Skull Base

Part V Tumors Around the Clivus

Part VI Tumors Around the Petrous Bone

Part VII Tumors of the Posterosuperior Skull Base

Part VIII Tumors of the Posteroinferior Skull Base

Part IX Tumors of the Ventricles

Video Contents

Foreword

I believe this book serves to highlight a watershed moment in the history of skull base surgery and marks the exact moment in time when the primary practitioners of this art came together to describe a more conservative philosophy in the application of "the implements of war," which we call skull base surgical approaches. Perhaps the book is even a quiet apology to, or at least a nod in the direction of, all those patients whom we may have harmed unwittingly in our quest for innovation and perfection. The early description of surgical approaches to skull base tumors was met with unbridled enthusiasm by many young and eager neurosurgeons, myself amongst them, believing our generation to be the one to "beat the meningioma" and meet the challenge laid before us by Harvey Cushing. But surgical cures can be elusive even when dealing with benign tumors that have a grasp on neurovascular structures and take hostage the quality, if not the quantity, of a patient's life.

Our enthusiasm for these operations waned not through thoughtful introspection but through collision with undeniable barriers placed in our path. These barriers included outcome analysis, quality of life measures, and natural history, the mortal enemy of many a bold and daring operative conquest. However, the greatest blow of all to our naively overzealous pursuit is perhaps the patients' participation in determining the quality of their own outcome and survival. Until these barriers came to light, patients had surgery because the surgeon felt it was necessary, and their outcomes were acceptable because the surgeon said it was. At the same time these techniques were being developed, there was also another technique developing on a parallel path: radiosurgery. The skull base surgeons attacked radiosurgery and radiosurgeons with a vengeance for their "cowardly approach" to tumors while the rest of us were engaged in heroic, sometimes epic battles. One such battle in my early years went on for twenty-eight hours, through three changes of shift, and in the last few hours felt like a battle being fought in quicksand. Somehow the patient survived, through no credit of my own. Eventually, surgeons relented and adopted radiosurgery, not as a rival, but as an ally against both the onslaught of the disease and the shortcomings of our surgery.

This is not a call to pull back on the development of our skills, our innovation, or our courage going into battle. When we enter the operating room, as we often must, we must be sharp, we must be determined, and we must be courageous. But it is an admonition to be sure we always place the interests of our patients above our own—above our interest to prove our surgical prowess, to prove our point of view, to prove our inventiveness. Remember the phrase, "Physician Know Thyself."

I know that at some point in a difficult tumor surgery, if the battle between me and the tumor becomes personal, the patient becomes an innocent bystander to events. Sometimes I write a message to myself on the operating room board to remind me who it is we are operating on and what they want: "This is a single mother of two children. Without her, they are orphans;" to serve as a reminder, in case I lose my way, that this is not about me.

I think that it must be impossibly hard sometimes for soldiers under fire to adhere to the "rules of engagement" and make profound sacrifices to protect the innocent. When surgeons enter the operating room, we, too, go into battle, and we, too, must be prepared to make profound sacrifices to protect the innocent, our patient: we must sacrifice our ego and resist the siren's call of fame.

Harry R. van Loveren, MD

Preface

"How do we get there?" I have been asked this question innumerable times by students, residents, and colleagues, as they ponder an image of a skull base tumor on a radiographic study. The central idea of this book is to take you through the decision-making process of choosing and executing a surgical approach for skull base tumors: from the assessment of the clinical presentation, to the appreciation of the nuances of the anatomical details on the diagnostic images, to the analytical thinking process of designing the operation. With variations in size and shape, differences in biological characteristics, unique anatomic locations and extensions, and particular relationships and entanglements with nerves and vessels, there are infinite ways skull base tumors are different from each other. Obviously, it is impossible to teach an infinite number of operations to remove these tumors. But, just as the English alphabet only has 26 letters and more words than one person can master, once we break down the operations into component parts, the process of designing an operation becomes teachable.

Which approach corridor to use, which craniotomy opening to make, which additional bony elements to remove… these are the building blocks for every skull base operation. Experienced surgeons mix and match these building blocks to design an operation, and they do so subconsciously. Teaching one how to perform each element is necessary but insufficient to train a skull base surgeon. It is equally important, if not more so, for surgeons to learn the analytical process of how to combine the building blocks to tailor-make the operation to fit a specific patient and the surgical goal. With that, the process of designing a skull base operation is de-mystified.

Many existing books on skull base surgery show you what neurosurgeons do; they are atlases with beautiful dissections, but limited, if any, discussion on the practical applications of the surgical steps. In others with more verbal content, the chapters are headed by disease entities, and the chapters flow from a discussion of the disease topic to generalized approaches for its surgical management. This book is very different. It focuses not only on what skull base surgeons do, but also equally on how they think and strategize. The chapters flow from clinical presentation and radiographic/anatomical findings of a specific patient and tumor to the decision-making process and execution of the surgical approach. Obviously, no military general would create a battle plan and then seek an enemy to fight with those plans. A strategist sees an enemy, analyzes its strength and weakness, investigates the intervening terrain, and then formulates a battle plan. Similarly, a surgeon meets a specific patient, analyzes the patient's clinical data, reflects upon his or her own surgical training and experience, and then decides what to do. The flow in each chapter of this book aims to follow this sequence, and the pedagogical process is achieved though real-life case examples, not through generalized or theoretical discussions.

Finally, it is important to highlight that strategic thinking and decision making in skull base surgery is not about finding the unique solution to the clinical problem. Unlike theoretical mathematics, in skull base surgery the path to the truth is seldom singular. There exist no two surgeons with the same training, similar successes, or identical failures. As such, each chapter of this book will have a concluding section with a different voice from another surgeon with a unique point of view. The aim is not to critique the ideas of the main chapter, nor to set up a debate on some controversy such as "endoscopic vs. open" approaches for a particular tumor. The Perspectives section is placed at the end of each chapter to embrace the variations in the "surgeon factors," to look at the same topic from a different angle.

Each chapter is intended to stand alone as a complete unit, to minimize the labor on your part referring back-and-forth between them. Moreover, different authors offer diverse perspectives on similar ideas, techniques, and approaches. I hope, therefore, that you will excuse some minor repetitions amongst certain chapters, and that these do not amount to redundancy.

Walter C. Jean, MD
Washington, DC, 2018

Acknowledgments

When the concept of this book was solidified, I was confronted with the daunting task of assembling a large cast of writers who are not only maestros in the art of skull base surgery, but who can also eloquently explain their thought process and meticulously describe their intricate technique to eager learners. My greatest fear was that few would be interested in participating, and thus even fewer would be predisposed to acquire the final product if it contained only my monotonous voice droning on chapter after chapter.

My fear dissipated when master-surgeons signed on, one by one. As the discourse in 21st century skull base surgery becomes increasingly global, I thought it important that the book contains ideas from people whose mother-tongue is not English, even though it is the base language of the publication. I am extraordinarily humbled by the colleagues from around the world, from Japan to Italy, from China to Brazil, who patiently recorded their hard-earned knowledge and insights in their second or third language and, additionally, by all the writers who graciously opened their vast archives of surgical travails and shared the most instructional cases with our readers. They also brought along a cavalcade of their prodigious disciples, whose diligent work fills the pages that follow. These learners-turned-teachers will assuredly become the next generation of skull base virtuosos and hopefully find good use for this book as their careers progress.

To have the privilege of steering this project, I am indebted first and foremost to my trainees, both former and current, for their challenging questions and constant curiosity. Working through complex clinical problems with them, and justifying my own conclusions, is the best way to continue my own learning, which will no doubt be a life-long process. My various colleagues and previous mentors deserve obvious gratitude, as without their belief in me I would have no career, let alone the chance to lead a project such as this. However, one of my teachers deserves the spotlight. Many of the contributors of the following chapters, including Professors Aziz, Youssef, Huang, Agazzi, van Gompel, Froelich, and Link, have also learned from the unparalleled skill and articulate lessons of the legendary teacher Harry van Loveren. As a master strategist, his instructions continue to permeate my decisions on a daily basis, whether in the operating suite, clinic, classroom, or in front of the computer.

I am thankful to my chairman, Dr. Anthony Caputy, and my colleagues at the George Washington University, for their support initiating this project and throughout the entire process. Similarly, I owe tremendous gratitude to my wife and two boys for indulging daddy working on his laptop from ski lodge to tropical resorts, sending emails during Santa's visit as well as weekends when our only callers were birds in the backyard, and even revising a figure with the production team, on the phone, on a ride, at Disney (yes, this actually happened).

My gratitude goes to the talented illustrator Jennifer Pryll, whose virtuosic artistry is surpassed only by her ability to decipher my arcane anatomical descriptions and transform my squiggles into works of art, even the ones shared with her from "It's a Small World." Finally, I must thank the staff at Thieme, and especially Timothy Hiscock and Sarah Landis, for the critical roles they played in transforming the writers' ideas into the book that is in your hand.

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