Preface

In the preface to his anatomy text collection *De Humani Corporis Fabrica*, published in 1543, Andreas Vesalius wrote, "… anatomy should rightly be regarded as the strong foundation of the whole art of medicine …," acknowledging the fundamental role the study of anatomy plays in the practice of medicine. Furthermore, one of the major lasting successes of his influential anatomy series was the ability to reproduce many superb illustrations of human anatomical dissections, made possible by the technical developments of his time.

Likewise, recent advancements in imaging technology and the development of newer postprocessing software have increased our ability to image and show the anatomical details of the human organs. At the same time, over the past decade, the literature has been filled with many anatomy articles and related topics. Unfortunately, there is an increasing gap between our fundamental core anatomy reference texts and our understanding and depiction of human anatomy using modern imaging and postprocessing methods. The idea for this project arose from the necessity for a text to fill this gap and describe anatomy in the context of current advances in imaging technology and science.

Computed tomography (CT) and magnetic resonance imaging (MRI) have been the traditional methods used for performing noninvasive studies, and both have immensely contributed to our ability to deliver accurate diagnostic information. Current-generation MR and CT, as well as dedicated peripheral and intraluminal ultrasound, provide the spatial and contrast resolutions required to demonstrate anatomical details with unprecedented accuracy.

When it comes to the assessment of details, there is no imaging modality that can compete with the speed, accuracy, and spatial resolution of new CT scanners. Volume rendering and multiplanar reformations facilitate understanding of complex structures such as the heart, vessels, and bones. With current scanners, the entire anatomical span of the major organs can be covered in a few seconds with a spatial resolution of less than 0.5 mm^3. In this series, this technology, along with the state-of-the-art postprocessing methods, has been used to create volumetric color-coded images.

On the other hand, MRI provides high levels of contrast resolution that would be difficult to obtain with CT. High-field MRI provides superb resolution of brain anatomy. Taking advantage of a 7-T MR scanner at our facility, high-quality images were obtained to complete the chapters of this volume. Using MR tractography, it is possible to detail the anatomical course of the white tracts, and with new postprocessing software, it is further possible to map areas of the brain cortex and subfield regions of small structures, such as the hippocampus. These technologies have ushered in a new era for the investigation of brain anatomy and are being used for the planning of sophisticated brain surgeries and for the localization of small regions of interest.

The *Imaging Anatomy* series is a reference atlas and text with a practical discussion of specific topics, along with examples of anatomical variants. Divided into four major volumes, each takes the instructive format of a classic text but infused with many images and illustrations to teach readers anatomy via state-of-the-art cross-sectional and volumetric imaging. The volumes are divided into lungs, mediastinum, and heart; abdomen and pelvis; bones, joints, muscles, vessels, and nerves; and brain, spinal cord, spine, head, and neck.

The length of each chapter and the number of images vary in accordance with the complexity of the topic. In all instances, effort has been made to provide a concise yet comprehensive review of the topic. Each chapter contains an in-depth review of the anatomy and anatomical variants. Pertinent embryology, microanatomy, and a brief description of physiology are provided in each chapter. Postsurgical anatomy and important gross and surgical pathology images are included.

The text is supported by high-quality cross-sectional images with correlative 3D and color-coded CT and MR views. Up-to-date references are used to support the text. Many new topics in radiology and surgery have been gathered from the recent 10-year literature. Surgical and clinical applications in each anatomy topic are presented with relevant images. To make each topic understandable, difficult anatomical concepts are supported by sketches as well as cross-sectional and topographic cadaveric views provided by internationally known anatomists. Superb cadaveric views are provided by Professor Damián Sánchez-Quintana, Professor R. Shane Tubbs, and the late Professor Albert L. Rhoton Jr. High-resolution axial cadaveric cuts are provided by the University of Auckland, New Zealand, thanks to the efforts of Professor Ali Mirjalili.

As the author and chief editor of this textbook, I was fortunate to receive the assistance of other editors who have shared their experiences for specific parts of this compilation. Countless contributors from high-ranking academic institutions with extensive experience in imaging, surgery, human anatomy, and embryology have also provided substantial work and shared their expertise. Together, over more than 5 years of constant and dedicated work, we have created a comprehensive textbook and atlas on imaging and surgical anatomy that aims to serve a broad spectrum of the medical community, including medical students, radiologists, surgeons, clinicians, and research scholars.

Finally, this collaborative effort would have remained unfinished without the unreserved assistance and expert guidance of the entire team at Thieme Publishers.

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