

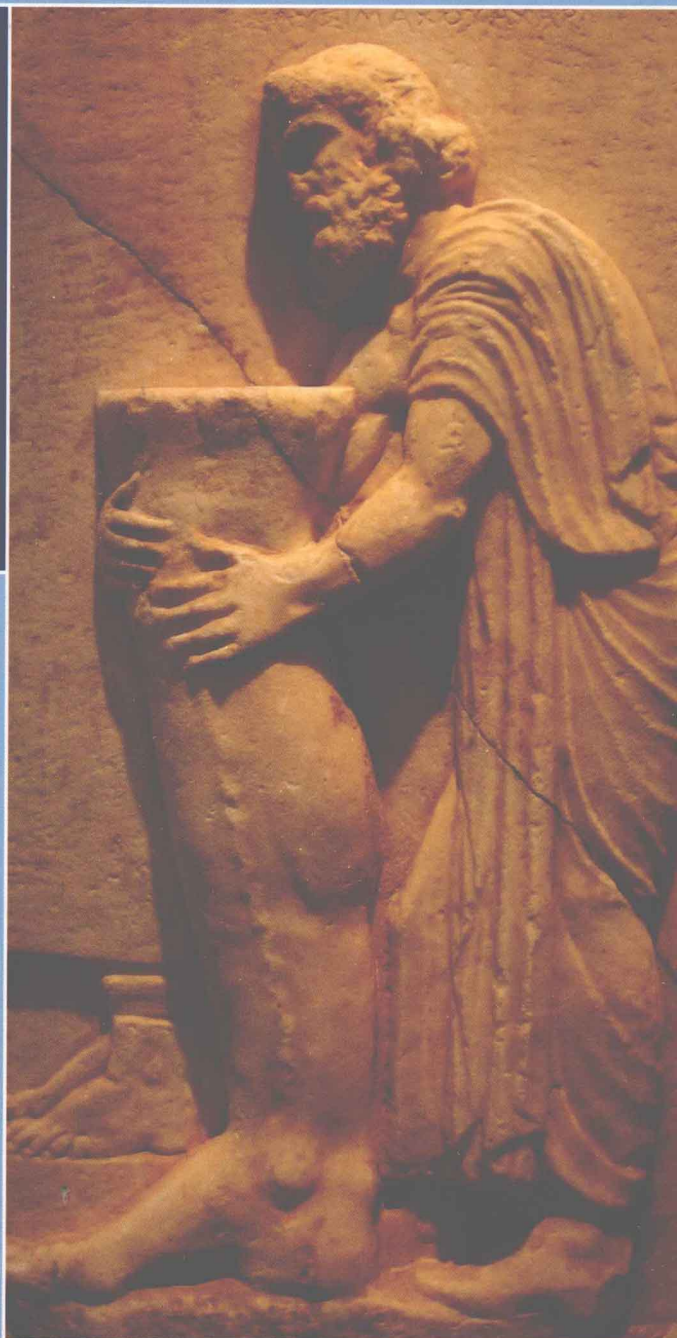
Deep Vein Thrombosis and Pulmonary Embolism

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Deep Vein Thrombosis and Pulmonary Embolism

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Cover image: Hippocrates treating thrombophlebitis on a relief located at the National Archeological Museum, Athens, Greece - image courtesy of Dr van Beek.

Dedications

To Miriam, Andrew and Steven with thanks for your support and understanding. To Jan-Wouter ten Cate, who taught me the basics of and love for thrombosis and haemostasis.

Edwin J.R. van Beek

I dedicate this book to the eminent German pathologist Rudolf Virchow (1821–1902), who discovered that blood clots in the pulmonary arteries originate as venous thrombi elsewhere. To this pathogenesis Virchow bestowed the name ‘Embolia’.

Matthijs Oudkerk

To my teachers.

Harry R. Büller

Preface

When we completed the first edition of this work, simply called *Pulmonary Embolism*, we could not have envisioned the many changes we would face over such a short period of time.

First, the rapid introduction of CT pulmonary angiography quickly changed the way in which imaging was involved in the diagnostic management of patients with suspected pulmonary embolism. In part, the easy accessibility of CT allowed a significant increase in tested patients, resulting in larger number of patients under evaluation for this disease. This led to a decrease in the prevalence of pulmonary embolism in the tested population, and an increasing concern regarding radiation burden as well as the burden (and costs) on healthcare.

Second, two important tests (plasma D-dimer and clinical decision rules) came of age, and this allowed for the simplification of the diagnostic assessment of many patients with either chest (PE) or leg (DVT) symptoms. The most recent guidelines all propose that with normal outcomes of these relatively simple tests, further imaging is no longer required and anticoagulant therapy can be safely withheld.

Third, the treatment went from cumbersome hospital-based approaches to a community and outpatient approach through the development of low molecular weight heparins and in the near future new oral anticoagulants. This has altered the rates of hospital admissions and also changed the way in which patients with DVT and PE are being seen and monitored. Last but not least, the role of nuclear perfusion/ventilation scanning diminished dramatically and also that of the gold standard, pulmonary angiography, became marginal with the development of multidetector CT systems which permit isotropic sub-millimetre resolution.

With all these (and other changes), it became apparent that a new edition of the book would be of potential use to the wider community, and we are grateful for the team at Wiley (which merged with our previous publisher, Blackwell), which allowed us to revisit the various chapters and produce a second edition, now also incorporating DVT. We have opted to keep to our previous sections approach, and have updated the current guidelines and various diagnostic tests completely to bring this work into the 21st century. We are extremely fortunate to have found such a wonderfully talented group of contributors from all over the world to participate in this endeavour. It is a rather thankless task to write book chapters, as the work is significant and the deadlines fairly strict in order to keep to publishing timetables. We have truly enjoyed working with such an esteemed group, who kept to time and helped create a book that is based on the literature evidence. This evidence-based approach is important as it is the only way to truly help understand the disease, perform the correct testing in the appropriate setting and treat the patient with optimal results.

Finally, Jan-Wouter ten Cate was unable to join this partnership due to health reasons, and we are grateful to Harry Büller for joining the Editors. We have been involved with many collaborative

studies and projects over the years, and this work is just another example of what a dedicated team of authors, Editors and publishing team can achieve. We truly hope that this work will be of help to many practising physicians in a wide spectrum of specialities, whether based in primary care or situated in hospital-based practice, the content of this book is surely going to assist you in managing your patients.

Edwin J.R. van Beek, Iowa City, IA, USA/Edinburgh, UK

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About the Editors

Professor Edwin van Beek is a Professor of Radiology, Medicine and Biomedical Engineering at the University of Iowa and practices as a cardiothoracic radiologist. An alumnus from Erasmus University Rotterdam Medical School, he received his formal radiology education and also obtained his PhD in the field of pulmonary embolism under the guidance of Professor Jan-Wouter ten Cate (a former editor of this book) and the current co-editor Professor Harry Büller. He has just accepted the Forbes Chair of Medical Imaging at the University of Edinburgh, Scotland, UK, where he will continue his work in the field of multimodality cardiac and pulmonary imaging from June 2009.

Professor Harry Büller is a Professor of Vascular Medicine at the Academic Medical Centre, Amsterdam, and a world-renowned expert in the field of venous thromboembolism. He received his medical training at the University of Amsterdam, and subsequently underwent his training in Internal Medicine in Amsterdam, after which he spent time at McMaster University, Hamilton, for his education in clinical epidemiology. He has been a sought-after consultant, has been involved in many key studies of management and treatment and has published widely on this topic during a career spanning more than 15 years.

Professor Matthijs Oudkerk is full Professor of Radiology at the State University of Groningen and internationally known for his pioneering work in the field of CT and MRI for cardiovascular and pulmonary vascular diseases at Erasmus University Rotterdam and the University Medical Centre Groningen. He received and obtained his medical education, PhD and his radiological training at Leiden University. For his work on cardiovascular radiology he was honoured by the Russian and Polish Academies of Sciences. He was the initiator of the development of management strategies in pulmonary embolism, about which he wrote the first publications together with Professor van Beek and Professor Büller in the early 1990s. He initiated and edited the first edition of this book together with Professor van Beek and Professor ten Cate.

The three editors of this second edition have worked together on a variety of projects for more than fifteen years, ranging from multidisciplinary consensus working groups, writing of articles to collaboration in multicentre trials.

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PART I

Introduction
