



Endovascular and Hybrid Management of the Thoracic Aorta

A Case-based Approach

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Contents

Preface

Foreword (Patrick M. McCarthy)

Foreword (Rodney A. White)

Acknowledgments

INTRODUCTION Current status of thoracic endografting

Gore TAG thoracic endoprosthesis

Device design

Feasibility study

Pivotal (phase II) trial

Follow-up

Results of the pivotal study

Operative data

Early adverse events

Confirmatory study

Results of the confirmatory study

Section I Thoracic aortic aneurysms

CASE 1 Endovascular repair of descending thoracic aortic aneurysms

using the Gore TAG stent graft

Introduction

Case scenario

Recommendation

Procedure

Discharge CT scan Discussion

References

CASE 2 Endovascular management of thoracic aortic aneurysm using a Cook Zenith TX2 endograft

Introduction

Case scenario

Endovascular procedure

Discussion

The STARZ trial

References

CASE 3 Endovascular management of a thoracic aortic aneurysm using a Medtronic Talent thoracic graft (VALOR trial)

Introduction

Case scenario

Intravascular ultrasound and angiogram

Surgical planning

Endovascular procedure

Discussion

The VALOR trial (vascular Talent thoracic stent-graft system for the treatment of thoracic aortic aneurysms)

Clinical experience

References

CASE 4 Endovascular management of thoracic aortic aneurysms with coverage of the left subclavian artery

Introduction

Case scenario

Access vessel

Endovascular technique

Discussion

References

CASE 5 Endovascular management of a thoracic aortic aneurysm with tortuous aorta and calcified iliac arteries using the brachiofemoral wire approach

Introduction

Case scenario

Endovascular procedure

Discussion

References

CASE 6 Endovascular management of a thoracic aortic aneurysm with small tortuous calcified iliac vessels (retroperitoneal conduit)

Introduction

Case scenario

Recommendations

Endovascular procedure

Retroperitoneal conduit with deployment of endograft

Discussion

References

CASE 7 Endovascular management of a ruptured thoracic aortic aneurysm

Introduction

Case scenario

Endovascular approach

Discussion

References

CASE 8 Total percutaneous endovascular management of a thoracic aneurysm with severe iliofemoral occlusive disease: use of an endoconduit in a high-risk patient

Introduction

Case scenario

[*Endovascular procedure*](#)

[*Discussion*](#)

[*References*](#)

[***CASE 9 Complete endovascular management of a patient with multilevel aortic disease***](#)

[*Introduction*](#)

[*Case scenario*](#)

[*Technical details*](#)

[*Discussion*](#)

[*References*](#)

[***CASE 10 Endovascular repair of a descending thoracic aneurysm with previous open resection of abdominal aortic aneurysm***](#)

[*Introduction*](#)

[*Case scenario*](#)

[*Technical details*](#)

[*Discussion*](#)

[*References*](#)

[***Section II Penetrating aortic ulcers***](#)

[***CASE 11 Endovascular management of penetrating aortic ulcer***](#)

[Introduction](#)

[Case scenario](#)

[Endovascular procedure](#)

[Discussion](#)

[References](#)

[CASE 12 Endovascular management of a penetrating aortic ulcer with rupture](#)

[Introduction](#)

[Case scenario 1](#)

[Procedure](#)

[Case scenario 2](#)

[Technical details](#)

[Discussion](#)

[References](#)

[Section III Traumatic aortic injuries](#)

[CASE 13 Endovascular management of thoracic aortic disruption](#)

[Introduction](#)

[Case scenario](#)

[Endovascular procedure](#)

[Discussion](#)

[References](#)

CASE 14 Endovascular management of a traumatic pseudoaneurysm postcoarctation repair

Introduction

Case scenario

Endovascular procedure

Discussion

References

CASE 15 Endovascular management of a traumatic pseudoaneurysm of the thoracic aorta

Introduction

Case scenario

Intravascular ultrasound procedure

Open surgery

Endovascular approach

Discussion

References

Section IV Thoracic aortic dissections

CASE 16 Endovascular management of acute Stanford type B dissection

Introduction

Case scenario

Endovascular procedure

Discussion

References

CASE 17 Endoluminal graft repair of chronic type B dissections

Introduction

Case scenario

Technical details (left carotid-subclavian bypass)

Technical details of endoluminal graft deployment for dissecting thoracic aneurysm

Discussion

References

CASE 18 Endovascular management of the aneurysmal false lumen distal to an interposition graft placed for ruptured Stanford type B dissection

Introduction

Case scenario

Thoracic aortogram and intravascular ultrasound

Technical details of procedure

Assessment and plan

Discussion

References

CASE 19 Hybrid management of type A dissection with malperfusion of the lower extremities

Introduction

Case scenario

Procedure

Discussion

References

CASE 20 Endovascular management of a type B dissection complicated by renovascular hypertension

Introduction

Case scenario

Endovascular procedure

Discussion

References

CASE 21 Endovascular management of a chronic type B dissection complicated with a new dissection and left renal artery compromise

Introduction

Case scenario

Endovascular procedure 1

Endovascular procedure 2

Discussion

References

CASE 22 Hybrid management of a retrograde type B dissection after endoluminal stent grafting

Introduction

Case scenario

Technical details of endoluminal graft deployment

Postoperative surveillance (retrograde type A dissection)

Discussion

References

Section V Thoracic aortic pseudoaneurysms

CASE 23 Endovascular management of thoracic aortic pseudoaneurysms

Introduction

Case scenario

Endovascular procedure

Discussion

References

CASE 24 Endovascular management of thoracic mycotic aneurysms

Introduction

Case scenario 1

Case scenario 2

[*Discussion*](#)
[*References*](#)

[**Section VI Extending proximal landing zones**](#)

[**CASE 25 Hybrid management of an arch aneurysm with a carotid-carotid bypass and deployment of an endoluminal graft**](#)

[*Introduction*](#)

[*Case scenario*](#)

[*Surgical technique*](#)

[*Deployment of endoluminal graft*](#)

[*Discussion*](#)

[*References*](#)

[**CASE 26 Endovascular management of transverse arch aneurysms**](#)

[*Introduction*](#)

[*Case scenario*](#)

[*Technical details \(left carotid-left subclavian bypass\)*](#)

[*Technical details \(deployment of thoracic endograft\)*](#)

[*Discussion*](#)

[*References*](#)

CASE 27 Hybrid endovascular management of an arch pseudoaneurysm using an antegrade deployment approach

Introduction

Case scenario

Procedural technique

Discussion

References

CASE 28 Hybrid management of a retrograde type B dissection

Introduction

Case scenario

Technical details

Endovascular approach

Discussion

References

CASE 29 Hybrid management of a chronic type B dissecting aneurysm with ascending aortic aneurysm

Introduction

Case scenario

Hybrid debranching with deployment of endoluminal graft

Discussion

References

Section VII Extending distal landing zones, 199

CASE 30 Hybrid repair of Extent II thoracoabdominal aneurysms

Introduction

Case scenario

Intravascular ultrasound (IVUS) and angiogram

Open surgical portion

Endovascular portion

Discussion

References

CASE 31 Hybrid repair of an extent V thoracoabdominal aneurysm

Introduction

Case scenario

Surgical techniques

Discussion

References

CASE 32 Hybrid (combined open and endovascular) repair of thoracoabdominal aneurysms

Classification of thoracoabdominal aneurysm (TAAA)

Introduction

[*Case scenario*](#)
[*Open surgical procedure*](#)
[*Endovascular procedure*](#)
[*Discussion*](#)
[*References*](#)

[**Section VIII Thoracic aortic coarctations**](#)

[***CASE 33 Endovascular management of adult primary coarctation of the aorta***](#)

[*Introduction*](#)
[*Case scenario*](#)
[*Endovascular therapy*](#)
[*Discussion*](#)
[*References*](#)

[***CASE 34 Endovascular management of the small thoracic aorta with postcoarctation pseudoaneurysm***](#)

[*Introduction*](#)
[*Case scenario*](#)
[*Technical details \(left carotid-subclavian
bypass\)*](#)
[*Technical details: deployment of a custom
assembled endoluminal graft*](#)
[*Discussion*](#)

References

CASE 35 Recurrent coarctation of the thoracic aorta

Introduction

Casescenario

Endovascular procedure

Discussion

References

Section IX Thoracic aortobronchial fistula

CASE 36 Endovascular management of aortobronchial fistulas

Introduction

Case scenario

Procedure

Discussion

References

Section X Complications of thoracic aortic endografting

CASE 37 Endovascular management of a type I endoleak

Introduction

[*Case scenario*](#)

[*Procedure*](#)

[*Discussion*](#)

[*References*](#)

[***CASE 38 Endovascular management of a type II endoleak***](#)

[*Introduction*](#)

[*Case scenario*](#)

[*Procedural details*](#)

[*Discussion*](#)

[*References*](#)

[***CASE 39 Retrograde dissection following endovascular management of thoracic aortic aneurysm***](#)

[*Introduction*](#)

[*Case scenario*](#)

[*Technical details of endoluminal graft deployment*](#)

[*Discussion*](#)

[*References*](#)

[***Section XI Ascending aortic pathologies***](#)

[***CASE 40 Endovascular management of an ascending aortic***](#)

pseudoaneurysm

Introduction

Case scenario

Endovascular approach

Discussion

References

CASE 41 Endovascular management of aneurysm of a right coronary vein graft using an ascending aorta endoluminal graft

Introduction

Case scenario

Technical details

Discussion

References

Section XII Supra-aortic thoracic aortic aneurysms

CASE 42 Hybrid approach to the management of a type C innominate artery aneurysm

Introduction

Case scenario

Technical details

Discussion

References

**Section XIII Future of thoracic
aortic endografting**

**CASE 43 Remote wireless pressure
sensing for postoperative
surveillance of thoracic endoluminal
grafts**

Introduction

Case scenario

Technical details

Discussion

References

**CASE 44 Zenith[®] DissectionTM Case
Study**

Introduction

Case scenario

References

The Road Ahead...

Index

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 **WILEY-BLACKWELL**

A John Wiley & Sons, Ltd., Publication

This edition first published 2008, © 2008 by Blackwell
Publishing Ltd

Blackwell Publishing was acquired by John Wiley & Sons in
February 2007. Blackwell's publishing program has been
merged with Wiley's global Scientific, Technical and Medical
business to form Wiley-Blackwell.

Registered office: John Wiley & Sons Ltd, The Atrium,
Southern Gate, Chichester, West Sussex, PO19 8SQ, UK

Editorial offices: 9600 Garsington Road, Oxford, OX4 2DQ,
UK

The Atrium, Southern Gate, Chichester, West Sussex, PO19
8SQ, UK

111 River Street, Hoboken, NJ 07030-5774, USA

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Library of Congress Cataloguing-in-Publication Data

Endovascular and hybrid management of the thoracic aorta/by Edward B. Diethrich... [et al.].

p.; cm.

Includes bibliographical references and index.

ISBN 978-1-4051-7535-7 (alk. paper)

1. Aorta-Surgery. 2. Thoracic arteries-Surgery. 3. Endarterectomy. I. Diethrich, Edward B., 1935-

[DNLM: 1. Aorta, Thoracic-surgery-Case Reports. 2. Aortic Diseases-surgery-Case Reports. 3. Vascular Surgical Procedures-methods-Case Reports. WG 410 E557 2008]

RD598.65.E53 2008

617.4'13-dc22

2008010765

ISBN: 9781405175357

Preface

When the Arizona Heart Institute's endovascular program was initiated well over two decades ago, no one could have envisioned its current acceptance by all disciplines given its checkered beginning, with skepticism and resistance to move from traditional therapies. Today, radiologists, vascular surgeons, vascular medicine specialists, cardiologists, and more recently cardiovascular surgeons have all recognized the enormous benefits of the endovascular approach to cardiovascular disease. Interventional technology has been proven to shorten hospitalization, reduce morbidity and mortality, speed recovery, and hasten return to normal life. Clinical investigations have shown these procedures to be favorable over open surgical techniques in most situations.

Despite these findings and the worldwide movement toward less invasive techniques, our training and educational programs have lagged behind the technology explosion. The core curricula in our current training residencies and fellowships in the majority of cases were not designed to easily accommodate the rapid evolution in endovascular technology. Hence, the need to revamp and expand our educational process to assure that current and future endovascular interventionalists will have adequate fundamental knowledge and skill sets.

Didactic lectures, simulations, hands-on training, and observation of the experts are all essential in this training paradigm. Importantly, learning by case example has been a hallmark in cardiovascular surgery training for decades. To assure an optimum result, the pathophysiology and anatomy of the disease process must be appreciated. Modern diagnostic tools, particularly new imaging modalities, must be understood and applied appropriately.

Interventionalists today must have not only an acquaintance with the growing variety of endovascular techniques, but also a working knowledge of their efficacy. In an effort to address these needs, we have called upon our vast endovascular experience to assemble this textbook of thoracic endovascular interventions. It is important to note that most cases in this textbook were performed under an investigational protocol with Institutional Board Review oversight. We earnestly believe that informed patients who adhere to a follow-up protocol will generate the much-needed data that can help us address the pressing questions in this blossoming field.

We recognize that certain limitations exist currently regarding thoracic endografting techniques and their application to thoracic aortic pathologies. There is every indication, however, that most thoracic aortic pathologies will be treated with these less invasive procedures in the future, and so this textbook should prove useful as this segment of the field expands. Our particular institution has been fortunate enough to be at the forefront of this technological revolution.

With this in mind, the textbook has been organized to begin with the currently accepted procedures and progress to those techniques for which proof of principle exists. It then proceeds to evolving areas of treatment in which further understanding and investigation are needed. The final chapters address the challenges of the ascending aortic arch, with recommendations for future endovascular technology. There is no substitute for learning from experience. It is our hope that endovascular management of the thoracic aorta with its case study approach will provide a useful tool for practitioners as they plan and execute treatment of patients with these thoracic aortic pathologies.

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Foreword

How do you teach new procedures involving brand-new, still evolving technologies to a diverse group of physicians? Dr Ted Diethrich and colleagues from the Arizona Heart Institute have successfully addressed this daunting problem in their comprehensive new textbook. Endovascular and hybrid management of thoracic aortic diseases have been rapidly advancing and these practitioners are clearly at the leading edge of this revolution. The authors use an interesting “case based” approach of approximately 50 cases that are very well illustrated with appropriate references. They range from relatively common problems, such as thoracic aortic aneurysms and chronic Type B aortic dissections, to more rare and challenging problems such as ascending aortic pseudoaneurysms. The authors make use of their outstanding background and clinical experience with the surgical treatment of aortic pathology add in new advanced imaging techniques such as 64-slice CT imaging and intravascular ultrasound, and show how endovascular and hybrid approaches can be applied to a variety of pathological conditions. The text itself is very well written and well illustrated and for those learning about this new field or those already with some experience, this is an important reference.

The publication is timely because of the rapid advancement and expansion of these approaches outside of traditional academic medical centers to a variety of clinical practices. The text should be of great interest to cardiovascular surgeons, cardiologists, vascular medicine specialists, and interventional radiologists. Dr Diethrich and his colleagues have done a tremendous service dedicating the time and effort into amassing this clinical experience

and disseminating it through the medical community at this early phase using this new technology.

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Foreword

The authors have presented a comprehensive, state-of-the-art review of the current status of thoracic aortic endografting. The format of the book is based on case reviews including indications for the procedure, concise discussions of therapeutical alternatives, and methods used during the procedure. The book covers the entire spectrum of thoracic pathologies and therapeutic options from fully endovascular repairs to the hybrid inventions combining endovascular approaches and conventional vascular surgical techniques. The text has excellent illustrations demonstrating not only the pathology being addressed, but appropriately selected procedural and post-intervention studies that illustrate not only the techniques and outcomes but also appropriate imaging modalities and imaging quality that is required for optimal outcomes.

The text contains approximately 50 case discussions. The text begins with a review of the approved Gore TAG device and the Food and Drug Administration–approved indications. This device is used in the majority of patients treated in the case studies. Other devices are described as they were used as part of ongoing clinical trials that were not completed at the time of the publication. The Gore TAG chapter outlines the approved indications and follow-up data regarding the outcomes that are available. The subsequent chapters each deal with a major thoracic pathology or with techniques that can be used to extend the utility of thoracic endoluminal devices, such as extending the proximal and distal landing zones and describing utility of hybrid techniques. There is also sections dealing with complications and addressing associated additional pathologies including ascending aortic and transverse thoracic arch pathologies. The text fully addresses all the approved current indications, developing