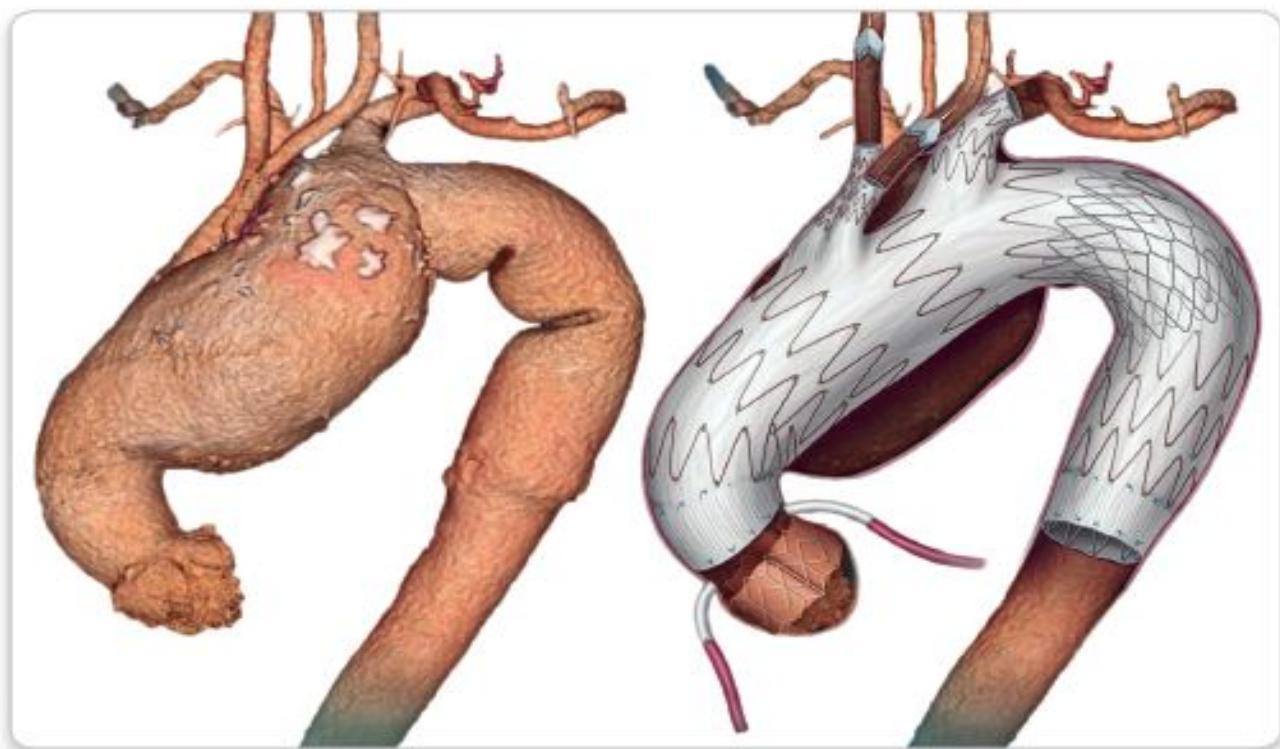


Endovascular and Hybrid Therapies for Structural Heart and Aortic Disease

Edited by Jacques Kpodonu and Raoul Bonan



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Contents

[About the companion website](#)

[Contributor list](#)

[Preface](#)

[List of videos](#)

[PART I Aorta](#)

[CHAPTER 1 Access techniques](#)

[Brachial access techniques used for aortic endografting](#)

[Techniques for constructing an endoconduit for aortic endografting](#)

[Transfemoral access techniques in aortic endografting](#)

[Retroperitoneal access for aortic endografting](#)

[CHAPTER 2 Equipment required for aortic endografting](#)

[Equipment lists](#)

[Further equipment information](#)

[CHAPTER 3 Advanced computed tomography imaging, workstations, and](#)

planning tools

CHAPTER 4 Technique of thoracic endografting for thoracic aneurysm using the approved Gore TAG device

Appendix: preference card

CHAPTER 5 Axillary/subclavian access for endovascular management of ascending and descending aortic pathologies

Introduction

Vascular access evaluation

Videoclips

CHAPTER 6 Endovascular repair of thoraco-abdominal aortic aneurysms

Endovascular alternatives for thoraco-abdominal aortic aneurysm repair

Principles of stent-graft design

Basic insertion technique

Patient selection

Preoperative preparation

Evolution of the device

Lessons of experience

Conclusions

CHAPTER 7 Hybrid endovascular aortic arch surgery

[Introduction](#)
[Hybrid endovascular surgery](#)
[Personnel requirements](#)
[Imaging requirements](#)
[Access and device sizing](#)
[Landing zone optimization](#)
[Hybrid procedures](#)
[Anesthetic considerations](#)
[Procedural techniques](#)
[Cases](#)
[Outcomes](#)
[Complications](#)
[On the horizon](#)
[Conclusions](#)

[CHAPTER 8 Acute aortic dissection](#)

[Introduction](#)
[Epidemiology](#)
[Pathogenesis](#)
[Clinical findings](#)
[Diagnostic tests and imaging studies](#)
[Treatment](#)
[Conclusions](#)
[Acknowledgments](#)

[CHAPTER 9 Complications of endovascular aneurysm repair](#)

[Introduction](#)
[Complications](#)

Conclusions

CHAPTER 10 Complications of thoracic aortic endografting

Introduction

Postoperative image surveillance for endoleaks

Type I endoleak

Type II endoleaks

Type III endoleaks

Complications

CHAPTER 11 Endovascular robotics for complex aortic intervention

Introduction

Advanced catheter technology

Robotic assistance for fenestrated stent-grafting

Future applications

Conclusions

Videoclip

PART II Structural heart disease

CHAPTER 12 Cardiovascular hybrid operating rooms

Introduction

Use of a hybrid operating room

Basics of the hybrid room

Imaging equipment

[Imaging methods and technologies](#)
[Future trends in hybrid operating rooms](#)
[Conclusions](#)
[Videoclips](#)

[CHAPTER 13 Access techniques for transcatheter aortic valves](#)

[Introduction](#)
[Patient selection](#)
[Transcatheter aortic valve devices](#)
[Femoral access techniques](#)
[Retroperitoneal access techniques](#)
[Deployment of an endoconduit in small calcified and tortuous iliac vessel](#)
[Ventricular apical access techniques](#)
[Axillary artery access techniques](#)
[Carotid artery access techniques](#)
[Brachial artery access techniques](#)
[Conclusions](#)

[CHAPTER 14 Transfemoral transcatheter aortic valve replacement](#)

[Introduction](#)
[Patient selection](#)
[Approved device description](#)
[Transfemoral TAVR: procedural steps](#)
[TAVR-related complications](#)
[Clinical trial outcomes](#)
[Specific patient subgroups](#)

[Future transcatheter aortic valve platforms](#)

[Conclusions](#)

[Conflict of interest statement](#)

[CHAPTER 15 Transapical valve technology for aortic stenosis](#)

[Introduction](#)

[Aortic stenosis](#)

[Devices available for TAVR](#)

[Patient selection](#)

[Procedure details](#)

[Imaging requirements](#)

[Complications](#)

[Future evolution of TAVR and new devices](#)

[Videoclips](#)

[CHAPTER 16 Axillary/subclavian access for transcatheter aortic valve replacement](#)

[Introduction](#)

[General considerations](#)

[Patient selection and imaging](#)

[Surgical access](#)

[Advantages of the use of the axillary/subclavian access](#)

[Conclusions](#)

[CHAPTER 17 Aortic valve replacement and transvalvular aortic valve replacement](#)

[Introduction](#)

[Development of prostheses](#)

[Results](#)

[Discussion](#)

[Safety concerns](#)

[Conclusions](#)

[Videoclip](#)

[CHAPTER 18 Transcatheter mitral leaflet repair](#)

[Introduction](#)

[Edge-to-edge procedure](#)

[Transapical beating heart chordal replacement](#)

[Videoclips](#)

[CHAPTER 19 Mitral valve: valvuloplasty for mitral stenosis/mitral regurgitation and available devices](#)

[Anatomic aspects of the mitral valve](#)

[Imaging of the mitral valve](#)

[Valvuloplasty for mitral stenosis](#)

[Mitral regurgitation and available devices](#)

[MitraClip procedure](#)

[Conclusions](#)

[CHAPTER 20 Real-time magnetic resonance imaging guidance in cardiac surgery](#)

[Introduction](#)

[Interactive real-time magnetic resonance imaging](#)
[Magnetic resonance compatibility of the instruments and devices](#)
[Device tracking](#)
[MRI-guided transapical aortic valve replacement](#)
[Conclusions](#)
[Videoclip](#)

[CHAPTER 21 Patent ductus arteriosus](#)

[Introduction](#)
[Patent ductus arteriosus anatomy](#)
[Patent ductus arteriosus detection](#)
[Patient evaluation](#)
[Closure devices and procedural information](#)
[Challenging anatomy](#)
[Complications](#)

[CHAPTER 22 Patent foramen ovale](#)

[Introduction](#)
[Patent foramen ovale anatomy](#)
[Patent foramen ovale detection](#)
[Patient evaluation](#)
[Devices and procedural information](#)
[Challenging anatomy](#)
[Complications](#)

[CHAPTER 23 Articulated Robotic MedProbe snake robot for single port surgery](#)

[Introduction](#)

[ARM snake robot](#)

[Cardiorobotics, Inc.](#)

[First human use of the ARM snake robot](#)

[Future of the ARM snake robot: the next generation catheter](#)

[Index](#)

Endovascular and Hybrid Therapies for Structural Heart and Aortic Disease

EDITED BY

Jacques Kpodonu, MD

Raney Zusman Medical Group
University of California Irvine
Cardiovascular Hybrid Interventions
Hoag Heart and Vascular Institute
Hoag Memorial Presbyterian Hospital
Newport Beach, CA, USA

Raoul Bonan, MD

Institut de Cardiologie de Montréal
University of Montréal
Montréal, Canada

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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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Contributor list

Ottavio Alfieri

Department of Cardiac Surgery
San Raffaele Hospital
Milan, Italy

Dabit Arzamendi, MD, MSc

Interventional Cardiology and Structural Heart Intervention
Department of Cardiology
Hospital de la Santa Creu i Sant Pau
Barcelona, Spain

Ricardo Aun, MD, PhD

Associate Professor in Vascular and Endovascular Surgery
Universidade de São Paulo
Hospital Albert Einstein
São Paulo, Brazil

Colin D. Bicknell, MD, FRCS

Regional Vascular Unit
St. Mary's Hospital
Imperial College London, UK

James H. Black, III, MD, FACS

Division of Vascular Surgery and Endovascular Therapy
Johns Hopkins University School of Medicine
Baltimore, MA, USA

Nicholas J. W. Cheshire, MD, FRCS

Regional Vascular Unit
St. Mary's Hospital
Imperial College
London, UK

Howie Choset, PhD

Robotics Institute
Carnegie Mellon University
Pittsburgh, PA, USA

Timothy A. M. Chuter

Division of Vascular Surgery
University of California San Francisco
San Francisco, CA, USA

Paolo Denti

Department of Cardiac Surgery
San Raffaele Hospital
Milan, Italy

Volkmar Falk, MD

Clinic for Cardiovascular Surgery
University Hospital Zurich
Zurich, Switzerland

Anne Figel

Siemens AG Healthcare Sector
Angiography, Fluoroscopic and Radiographic Systems
Forchheim, Germany

Thierry Folliguet

Pôle Territorial Lorrain Chirurgie Cardiaque Vasculaire et
Transplantation Institut
Lorrain du Coeur et des Vaisseaux Louis Mathieu Centre
Hospitalier U
Vandoeuvre
Les Nancy Cedex 54511
France

Jurg Grunenfelder, MD

Clinic for Cardiovascular Surgery
University Hospital Zurich
Zurich, Switzerland

Mohamad S. Hamady

Regional Vascular Unit
St. Mary's Hospital
Imperial College
London, UK

Thomas Hartkens

Siemens AG Healthcare Sector
Angiography, Fluoroscopic and Radiographic Systems
Forchheim, Germany

Stéphan Haulon, MD, PhD

Hôpital Cardiologique
CHRU de Lille, France

Keith A. Horvath

NIH Heart Center at Suburban Hospital
Cardiothoracic Surgery Research Program
National Heart, Lung and Blood Institute
National Institutes of Health
Bethesda, MD, USA

Hasan Jilaihawi

Cedars-Sinai Heart Institute
Los Angeles, CA, USA

Saibal Kar

Cardiovascular Intervention Center Research
Cedars-Sinai Heart Institute
Los Angeles, CA, USA

Theodoros Kofidis, MD

Senior Consultant, Department of Cardiac, Thoracic and Vascular Surgery
National University Heart Center
Singapore

Jacques Kpodonu, MD

Raney Zusman Medical Group
University of California Irvine
Cardiovascular Hybrid Interventions
Hoag Heart and Vascular Institute
Hoag Memorial Presbyterian Hospital
Newport Beach, CA, USA

François Laborde

Department of Cardiovascular Surgery
Institut Mutualiste Montsouris
Paris, France

Ruediger Lange, MD, PhD

Department of Cardiac Surgery
German Heart Center Munich
Munich, Germany

Gilles Lemesle, MD

Service de Cardiologie B et Centre Hémodynamique
Pôle de Cardiologie
Hôpital Cardiologique
CHRU de Lille, France

Ming Li

Cardiothoracic Surgery Research Program
National Heart, Lung and Blood Institute
National Institutes of Health
Bethesda, MD, USA

Mohsen Mahvash, PhD

Division of Cardiothoracic Surgery, BHS
Medical Robotics and Computer Assisted Surgery (MRCAS)
Laboratory
Harvard Medical School
Boston, MA, USA

Francesco Maisano, MD, FESC

Transcatheter Valve Interventions Program
Cardiothoracic and Vascular Institute
San Raffaele Hospital
Milan, Italy

Giuseppe Martucci, MD, FRCPC

Department of Interventional Cardiology at McGill University
Health Center (MUHC)
Royal Victoria Hospital
Montreal, Canada

Dumitru Mazilu

Cardiothoracic Surgery Research Program
National Heart, Lung and Blood Institute
National Institutes of Health
Bethesda, MD, USA

Thomas Modine, MD, PhD, MBA

Service de Chirurgie Cardio-vasculaire
Pôle de Chirurgie Cardio-vasculaire
Hôpital Cardiologique
CHRU de Lille, France

Friedrich W. Mohr, MD, PhD

Heart Center
Leipzig University
Leipzig, Germany

Darren Mylotte, MD, MRCPI

Department of Interventional Cardiology at McGill University
Health Center (MUHC)
Royal Victoria Hospital
Montreal, Canada

Georg Nollert

Siemens AG Healthcare Sector
Angiography, Fluoroscopic and Radiographic Systems
Forchheim
Clinic of Cardiac Surgery
University of Munich
Munich, Germany

Babak Orandi, MD, MSc

Department of Surgery
Johns Hopkins Hospital
Baltimore, MD, USA

Paolo Perini, MD

Vascular Surgery
Hôpital Cardiologique
CHRU de Lille, France

Mark D. Peterson, MD, PhD, FRCSC

Division of Cardiac Surgery
St. Michael's Hospital
University of Toronto
Toronto, Ontario, Canada

Nicolo Piazza, MD, PhD, FRCPC, FESC

Department of Interventional Cardiology at McGill University
Health Center (MUHC)
Royal Victoria Hospital
Montreal, Canada
Department of Cardiac Surgery
German Heart Center Munich
Munich, Germany

Andre Plass, MD

Clinic for Cardiovascular Surgery
University Hospital Zurich
Zurich, Switzerland

Mark Reisman, MD

Swedish Heart and Vascular Institute
Swedish Medical Center
Seattle, WA, USA

Pascal Rheaume, MD

Vascular Surgery
Hopital St-Francois D'Assise
Quebec City, Canada

Celia V. Riga, MBBS, BSc

Regional Vascular Unit
St. Mary's Hospital
Imperial College
London, UK

Eduardo Keller Saadi, MD, PhD

Federal University of Rio Grande do Sul
Hospital de Clinicas de Porto Alegre
Chief, Center for Aortic Diseases
Hospital Mae de Deus
Porto Alegre, Brazil

Joerg Seeburger, MD

Heart Center
Leipzig University
Leipzig, Germany

Arnaud Sudre, MD

Service de Cardiologie B et Centre Hémodynamique
Pôle de Cardiologie

Hôpital Cardiologique
CHRU de Lille, France

Sabine Wich

Siemens AG Healthcare Sector
Angiography, Fluoroscopic and Radiographic Systems
Forchheim, Germany

Bobby Yanagawa, MD, PhD

Division of Cardiac Surgery
St. Michael's Hospital
University of Toronto
Toronto, Canada

Marco A. Zenati, MD, MSc

Harvard Medical School
Boston, MA, USA

Preface

Since the first reports of endovascular repair of abdominal aortic aneurysm (AAA) and transcatheter aortic valve replacement in the early 1990s and 2000s, there has been an explosion in the volume and complexity of endovascular and hybrid procedures for the treatment of aortic diseases and structural heart diseases. Endovascular and hybrid techniques and technologies have evolved from the initial devices and continue to evolve allowing for the treatment of most aortic pathologies and most structural heart pathologies. These new endoaortic surgical procedures and transcatheter valve therapies have proven to shorten hospitalization, reduce morbidity and mortality, speed recovery, and hasten return to normal life. The evolution and conceptual design of the endoaortic grafts and transcatheter valves used to treat these complex pathologies would obviously not be possible without the simultaneous explosion in medical imaging technologies and the development of advanced hybrid surgical rooms and hybrid surgical techniques, which has taken place over a similar time period.

With chapters written in a comprehensive yet concise manner and numerous illustrations, this book aims to engage readers further with additional video materials. We hope that this textbook will be a useful tool for practitioners planning to execute treatment on patients with these various aortic and structural heart pathologies as well as serve as a useful reference as the field of segment continues to evolve.

Jacques Kpodonu, MD
Raoul Bonan, MD

List of videos

- [Video 5.1](#)** Construction of an 8 mm Dacron conduit on the right axillary artery.
- [Video 5.2](#)** Advancement of a thoracic aortic device through the axillary conduit.
- [Video 5.3](#)** Positioning of a thoracic aortic device with contrast aortography.
- [Video 5.4](#)** Deployment of a thoracic aortic device under fluoroscopic guidance.
- [Video 5.5](#)** Balloon angioplasty of a thoracic aortic device.
- [Video 11.1](#)** Video demonstration of vascular robotic cannulation of fenestration in an in vivo model.
- [Video 12.1](#)** Aortic valve replacement with the help of intraoperative DynaCT imaging and overlay of reconstructed 3D volumes on live fluoroscopy. The video is described comprehensively in the legend of [Fig. 12.3](#). Courtesy of the Heart Center, Leipzig; prototype software under clinical trial.
- [Video 12.2](#)** The abdominal aortic aneurysm was diagnosed with multislice CT. The rendered 3D volume of the aorta was registered with an intraoperatively obtained DynaCT volume. Contours of the 3D volume are then overlaid on live fluoroscopy and are automatically adjusted by changes of projection, table position, zoom factor, etc. Courtesy of St. Olav's Hospital, Trondheim; prototype software under clinical trial.
- [Video](#)** Intraoperative DynaCT of a fenestrated stent-graft

12.3 for the repair of a complex abdominal aneurysm.
Courtesy of Dr. Roy Greenberg, Cleveland Clinic
Foundation, Cleveland, OH.

Video
15.1 Animation Edwards Ascendra 2 system.

Video
15.2 Case presentations: Edwards Ascendra 2
transapical heart valve (Sapien XT 23 mm).

Video
15.3 Case presentations: Medtronic Engager transapical
heart valve (Engager 26 mm).

Video
15.4 Animation of the transapical deployment of the
JenaValve.

Video
17.1 Surgical implantation of the Perceval S sutureless
aortic valve prosthesis.

Video
18.1 MitraClip procedure.

Videos
18.2-
18.6 Transapical neochord procedure.

Video
20.1 Transapical aortic valve replacement under MRI
guidance.

PART I

Aorta

CHAPTER 1

Access techniques

Jacques Kpodonu

University of California Irvine,
Cardiovascular Hybrid Interventions, Hoag Heart and
Vascular Institute, Newport Beach, CA, USA

Brachial access techniques used for aortic endografting

Brachial and radial access techniques allow the utilization of angiographic catheters to assist with proximal deployment of thoracic stent-grafts [1]. They allow for easy identification of the left subclavian artery, and angiography can be performed to avoid coverage with the proximal end of a thoracic stent. When coverage of the left subclavian artery is required for an adequate proximal landing zone, subclavian to carotid bypassing may be required. The radial or brachial access can therefore accommodate subclavian artery coil embolization to minimize the risk of type II endoleaks.

The brachial artery has an enveloping fascial sheath, therefore, when a hematoma does occur, brachial plexopathies are more common. In addition, upper extremity vessels tend to spasm more frequently during

manipulation, making access more challenging. Brachial access does carry the added risk of distal ischemia and embolization over radial access. Although sheaths up to 6 or 7 Fr (3 Fr $\approx$ 1 mm) may be percutaneously placed in either vessel, radial access should be preferred over brachial because of a lower complication profile, and open access used for larger sheaths or on smaller patients.

The left brachial artery is preferred over the right so as to avoid the origin of the right common carotid artery. The technique requires that the arm be abducted on an arm board with the arm circumferentially prepped. The artery is palpated just proximal to the antecubital fossa where the biceps muscle thins out to its tendinous insertion. Percutaneous retrograde puncture of the brachial artery with a 21 gauge micropuncture kit is preferred to the 18 gauge due to the smaller size of the vessel ([Fig. 1.1a](#)). Catheter-over-wire exchange can then be performed to the desired sheath. Sheaths up to 6 Fr can be placed with relative safety ([Fig. 1.1b](#)). Long sheaths can help deal with the inherent vasospasm.

In tortuous aorta, the use of the brachio-femoral wire may be required to aid advancement and deployment of an endograft. Deployment of an endoluminal graft in a tortuous aorta may be difficult, requiring the use of a brachio-femoral wire ([Fig. 1.2](#)). Use of brachio-femoral access wires can help straighten the most angulated of vessels. The presence of a tortuous aorta requires brachio-femoral access to deploy an endoluminal graft ([Fig. 1.3](#)). Brachial access is obtained by a percutaneous retrograde puncture of the right brachial artery with an 18 gauge needle or a micropuncture needle. An extra long 450 cm, 0.035 inch angled glide wire is advanced through the brachial sheath into the tortuous thoracic aorta, snared and pulled out through the groin sheath. The technique requires that a protective guiding catheter be placed over the brachial artery to protect the

subclavian artery from injury. It is important to have at least a 260 cm long wire and constant tension must be placed on both ends of the wire as the delivery sheath is passed into the aorta [2,3]. By pulling on both ends of the wire an endoluminal graft can be advanced up into the tortuous arch aorta with precise deployment of the endoluminal graft.

Fig. 1.1 (a) A retrograde percutaneous puncture of the brachial artery with (b) the placement of an introducer sheath.

