

心脏外科手术 技术图谱

Atlas of Cardiac Surgical Techniques

主 编 Frank W. Sellke
Marc Ruel

主 译 谷天祥



北京大学医学出版社

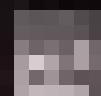


心脏外科手术 技术图谱

Atlas of Cardiac Surgical Technology

主 编 王 强 王 强
副 编 王 强 王 强

主 编 王 强



人民卫生出版社

心脏外科手术技术图谱

Atlas of Cardiac Surgical Techniques

主 编 Frank W. Sellke

Marc Ruel

主 译 谷天祥

北京大学医学出版社
Peking University Medical Press

图书在版编目 (CIP) 数据

心脏外科手术技术图谱/ (美) 塞尔克 (Sellke, F. W.) 等主编;

谷天祥主译. —北京: 北京大学医学出版社, 2010. 10

书名原文: Atlas of Cardiac Surgical Techniques

ISBN 978-7-5659-0010-5

I. ①心… II. ①塞…②谷… III. ①心脏外科手术-图谱

IV. ①R654.2-64

中国版本图书馆CIP数据核字 (2010) 第186667号

北京市版权局著作权合同登记号: 图字: 01-2010-6989

Atlas of Cardiac Surgical Techniques

Frank W. Sellke, Marc Ruel

ISBN-10: 1-4160-4065-X

ISBN-13: 978-1-4160-4065-1

Copyright © 2010 by Saunders, an imprint of Elsevier Inc. All rights reserved.

Authorized Simplified Chinese translation from English language edition published by the Proprietor.

981-272-639-X

978-981-272-639-1

Elsevier(Singapore) Pte Ltd.

3 Killiney Road, #08-01 Winsland House I, Singapore 239519

Tel: (65)6349-0200, Fax: (65)6733-1817

First Published 2011

2011年初版

Simplified Chinese translation Copyright © 2010 by Elsevier(Singapore) Pte Ltd and Peking University Medical Press. All right reserved.

Published in China by Peking University Medical Press under special agreement with Elsevier(Singapore) Pte.Ltd. This edition is authorized for sale in China only, excluding Hong Kong SAR and Taiwan. Unauthorized export of this edition is a violation of the Copyright Act. Violation of this Law is subject to Civil and Criminal Penalties.

本书简体中文版由北京大学医学出版社和Elsevier(Singapore) Pte Ltd. 在中国大陆境内(不包括香港特别行政区及台湾)协议出版。本版仅限在中国境内 (不包括香港特别行政区及台湾) 出版及标价销售。未经许可之出口, 是为违反著作权法, 将受法律之制裁。

心脏外科手术技术图谱

主 译: 谷天祥

出版发行: 北京大学医学出版社 (电话: 010-82802230)

地 址: (100191) 北京市海淀区学院路38号 北京大学医学部院内

网 址: <http://www.pumpress.com.cn>

E-mail: booksale@bjmu.edu.cn

印 刷: 北京佳信达欣艺术印刷有限公司

经 销: 新华书店

责任编辑: 畅晓燕 责任校对: 金彤文 责任印制: 张京生

开 本: 889mm × 1190mm 1/16 印张: 29.5 字数: 390千字

版 次: 2011年1月第1版 2011年1月第1次印刷

书 号: ISBN 978-7-5659-0010-5

定 价: 342.00元

版权所有, 违者必究

(凡属质量问题请与本社发行部联系退换)

著者名单

Arvind K. Agnihotri, MD

Assistant Professor of Surgery, Harvard Medical School, Massachusetts General Hospital, Boston, Massachusetts
Postinfarction Ventricular Septal Defect

Craig J. Baker, MD

Assistant Professor of Surgery; Vice Chair of Surgical Education, Cardiovascular Thoracic Institute, University of Southern California Keck School of Medicine, Los Angeles, California
Ross Procedure

Joseph E. Bavaria, MD

Brooke Roberts-William M. Measey Professor of Surgery; Vice Chief of Division of Cardiovascular Surgery; Director of Thoracic Aortic Surgery Program, University of Pennsylvania School of Medicine, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania
Thoracic Endovascular Aortic Repair for Descending Thoracic Aortic and Aortic Arch Aneurysms

Munir Boodhwani, MD, MMSc

Clinical Associate, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
Incisions for Cardiac Surgery

William T. Brinkman, MD

Cardiovascular Surgeon, The Heart Hospital Baylor Plano, Baylor University Medical Center, Dallas, Texas
Thoracic Endovascular Aortic Repair for Descending Thoracic Aortic and Aortic Arch Aneurysms

Vincent Chan, MD

Chief Resident, Division of Cardiac Surgery, University of Ottawa Heart Institute Ottawa, Ontario, Canada
Minimally Invasive Cardiac Surgical Coronary Artery Bypass Grafting

Michael A. Coady, MD, MPH

Associate Professor of Surgery, Brown University School of Medicine, Providence, Rhode Island
Type A Aortic Dissections

Lawrence H. Cohn, MD

Professor of Cardiac Surgery, Harvard Medical School; Cardiac Surgeon-in-Chief Emeritus, Brigham and Women's Hospital, Boston, Massachusetts
Repair of the Myxomatous Degenerated Mitral Valve

William E. Cohn, MD

Associate Professor, Baylor College of Medicine; Director of Minimally Invasive Surgical Technology, The Texas Heart Institute at St. Luke's Episcopal Hospital, Houston, Texas
Percutaneous Mitral Valve Repair Techniques
Pulsatile and Axial Ventricular Support

Joseph S. Coselli, MD

Professor and Cullen Foundation Endowed Chair, Division of Cardiothoracic Surgery, Baylor College of Medicine; Chief of Adult Cardiac Surgery, The Texas Heart Institute at St. Luke's Episcopal Hospital, Houston, Texas
Thoracoabdominal Aneurysms

Tirone E. David, MD

Professor, University of Toronto; Head of Division of Cardiac Surgery, Toronto General Hospital, Toronto, Ontario, Canada
Aortic Valve-Sparing Operations

John R. Doty, MD

Clinical Associate Professor of Surgery, University of Utah; Staff Surgeon, Intermountain Medical Center, Salt Lake City, Utah
Aortic Root Enlargement Techniques

Amir K. Durrani, MD

Categorical Resident, Department of Internal Medicine, Yale University School of Medicine, New Haven, Connecticut
Minimally Invasive Mitral Valve Replacement: Partial Sternotomy Approach

Volkmar Falk, PhD

Professor, University of Leipzig; Heart Surgeon, Heart Center of Leipzig, Leipzig, Germany
Robotic Coronary Artery Bypass Grafting

Lynn M. Fedoruk, MD, FRCSC

Clinical Instructor, University of British Columbia,
Vancouver, British Columbia; Attending Physician,
Royal Jubilee Hospital, Victoria, British Columbia,
Canada

Surgery for Left Ventricular Aneurysm and Remodeling

Michael P. Fischbein, MD, PhD

Assistant Professor of Cardiothoracic Surgery, Stanford
University School of Medicine, Stanford, California

Type B Aortic Dissections

O. H. Frazier, MD, FACS, FACC

Clinical Professor, University of Texas M.D. Anderson
Cancer Center; Professor, University of Texas
Medical School Houston, Baylor College of
Medicine; Director of Cardiovascular Surgical
Research; Chief of Cardiopulmonary
Transplantation, The Texas Heart Institute at St.
Luke's Episcopal Hospital; Chief of Transplant
Services, St. Luke's Episcopal Hospital, Houston,
Texas

Pulsatile and Axial Ventricular Support

A. Marc Gillinov, MD

Attending Surgeon, Department of Thoracic and
Cardiovascular Surgery, Cleveland Clinic; Judith
Dion Pyle Chair in Heart Valve Research; Surgical
Director, Center for Atrial Fibrillation, Cleveland,
Ohio

*Minimally Invasive Mitral Valve Replacement: Partial Sternotomy
Approach*

Surgery for Atrial Fibrillation

Thomas G. Gleason, MD

Associate Professor of Surgery, University of
Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Type A Aortic Dissections

Igor D. Gregoric, MD

Clinical Assistant Professor, University of Texas
Medical School Houston; Director of Center for
Cardiac Support, The Texas Heart Institute at St.
Luke's Episcopal Hospital, Houston, Texas

Pulsatile and Axial Ventricular Support

John S. Ikonomidis, MD, PhD

Professor, Department of Cardiothoracic Surgery,
Medical University of South Carolina; Chief of
Division of Cardiothoracic Surgery, Ralph H.
Johnson Veterans Administration Medical Center,
Charleston, South Carolina

Aortic Arch Aneurysms

Stephan Jacobs, MD

Associate Professor, University of Leipzig; Heart
Surgeon, Heart Center of Leipzig, Leipzig, Germany
Robotic Coronary Artery Bypass Grafting

Tanveer A. Khan, MD

Clinical Instructor, David Geffen School of Medicine
at University of California, Los Angeles, Los
Angeles, California

Heart-Lung Transplantation

Anastasios K. Konstantakos, MD

Cardiothoracic Surgeon, Billings Clinic, Billings,
Montana

On-Pump Coronary Artery Bypass Grafting

Irving L. Kron, MD

Professor and Chairman, Department of Surgery,
University of Virginia Health System,
Charlottesville, Virginia

Surgery for Left Ventricular Aneurysm and Remodeling

Alexander Kulik, MD, MPH, FRCSC

Cardiovascular Surgery Fellow, Missouri Baptist
Medical Center, St. Louis, Missouri

Tricuspid Valve Operations

Hillel Laks, MD

Professor, David Geffen School of Medicine at
University of California, Los Angeles, Los Angeles,
California

Heart-Lung Transplantation

Harry Lapierre, MD, FRCSC

Clinical Associate, University of Montreal Faculty of
Medicine, Montreal, Quebec; University of Ottawa
Heart Institute, Ottawa, Ontario, Canada

Minimally Invasive Cardiac Surgical Coronary Artery Bypass Grafting

Scott A. LeMaire, MD

Associate Professor and Director of Research, Division
of Cardiothoracic Surgery, Baylor College of
Medicine; Cardiovascular Surgery Staff, The Texas
Heart Institute at St. Luke's Episcopal Hospital,
Houston, Texas

Thoracoabdominal Aneurysms

Daniel Marelli, MD

Clinical Associate, University of Pennsylvania School
of Medicine, Philadelphia, Pennsylvania; Bay Health
Medical Center, Dover, Delaware

Heart Transplantation

Joseph T. McGinn, Jr., MD
Clinical Assistant Professor, State University of New York Downstate, Brookhaven, New York; Clinical Associate Professor of Surgery, New York Medical College, Valhalla, New York; Director of Cardiothoracic Surgery, Staten Island University Hospital; Medical Director, The Heart Institute of Staten Island, Staten Island, New York
Minimally Invasive Cardiac Surgical Coronary Artery Bypass Grafting

Thierry G. Mesana, MD, PhD, FECTS, FRCSC
University of Ottawa Faculty of Medicine, Michael Pitfield Research Chair in Cardiac Surgery, Chief of Cardiac Surgery, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
Tricuspid Valve Operations

Tomislav Mihaljevic, MD
Attending Surgeon, Department of Thoracic and Cardiovascular Surgery, Cleveland Clinic Foundation, Cleveland, Ohio
Minimally Invasive Mitral Valve Replacement: Partial Sternotomy Approach
Surgery for Atrial Fibrillation

R. Scott Mitchell, MD
Professor of Cardiothoracic Surgery, Stanford University School of Medicine, Stanford, California
Type B Aortic Dissections

Friedrich W. Mohr, PhD
Professor, University of Leipzig; Heart Surgeon, Heart Center of Leipzig, Leipzig, Germany
Robotic Coronary Artery Bypass Grafting

Nahush A. Mokadam, MD
Assistant Professor of Cardiothoracic Surgery, University of Washington Medical Center, Seattle, Washington
Aortic Homografts

Sorin V. Pusca, MD
Instructor in Cardiothoracic Surgery, Emory University School of Medicine, Atlanta, Georgia
Off-Pump Coronary Artery Bypass Grafting

John D. Puskas, MD
Professor of Surgery, Emory University School of Medicine; Chief of Division of Cardiothoracic Surgery, Emory Crawford Long Hospital, Atlanta, Georgia
Off-Pump Coronary Artery Bypass Grafting

Ladislav Ressler, MD
Assistant Professor, Clinical Associate in Cardiac Surgery, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
Cannulation Techniques for Cardiopulmonary Bypass

Jason O. Robertson, MD
General Surgery Resident, Washington University in St. Louis School of Medicine; Barnes-Jewish Hospital, St. Louis, Missouri
Minimally Invasive Mitral Valve Replacement: Partial Sternotomy Approach

Roberto Rodriguez, MD
Assistant Professor of Surgery, Tufts University School of Medicine; Cardiothoracic Surgeon, St. Elizabeth's Medical Center, Boston, Massachusetts
Aortic Valve Replacement

Fraser D. Rubens, MD, MSc, FRCSC
Professor of Surgery; Director of Cardiac Surgery Residency and Fellowship Program, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
Cannulation Techniques for Cardiopulmonary Bypass

Marc Ruel, MD, MPH, FRCSC
Associate Professor of Surgery, Cellular and Molecular Medicine, and Epidemiology; Cardiac Surgery Research Chair, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
Incisions for Cardiac Surgery
Minimally Invasive Cardiac Surgical Coronary Artery Bypass Grafting

Frank W. Sellke, MD
Chief of Cardiothoracic Surgery and Karl E. Karlson and Gloria A. Karlson Professor of Cardiothoracic Surgery, Alpert School of Medicine of Brown University, Rhode Island Hospital, and The Miriam Hospital; Co-Director of the Lifespan Heart Center, Providence, Rhode Island; Visiting Professor of Surgery, Harvard Medical School, Boston, Massachusetts
On-Pump Coronary Artery Bypass Grafting
Aortic Valve Replacement

Kapil Sharma, MD, FRCSC
Cardiac Surgery West Medical Corporation
Sacramento, California
Type B Aortic Dissections

Richard J. Shemin, MD

Robert and Kelly Day Chair of Cardiothoracic Surgery,
David Geffen School of Medicine at University of
California, Los Angeles; Professor and Chief of
Cardiothoracic Surgery; Co-director of University
of California, Los Angeles, Cardiovascular Center;
Executive Vice Chair of Department of Surgery,
UCLA Ronald Reagan Medical Center, Los Angeles,
California

Bentall Procedure

Scott Silvestry, MD

Associate Professor of Surgery, Jefferson Medical
College of Thomas Jefferson University; Surgical
Director of Heart Transplant Program, Thomas
Jefferson University Hospital, Philadelphia,
Pennsylvania

Heart Transplantation

Vaughn A. Starnes, MD

H. Russell Smith Foundation Chair, Distinguished
Professor of Surgery, Cardiovascular Thoracic
Institute, University of Southern California Keck
School of Medicine, Los Angeles, California

Ross Procedure

Wilson Y. Szeto, MD

Assistant Professor of Surgery, University of
Pennsylvania School of Medicine, Hospital of
the University of Pennsylvania, Division of
Cardiovascular Surgery, Philadelphia, Pennsylvania
*Thoracic Endovascular Aortic Repair for Descending Thoracic Aortic
and Aortic Arch Aneurysms*

Peter I. Tsai, MD

Assistant Professor of Cardiothoracic Surgery, Baylor
College of Medicine; Surgical Staff, Ben Taub
General Hospital, Houston, Texas
Thoracoabdominal Aneurysms

Thomas A. Vassiliades, Jr., MD, MBA

Associate Professor of Surgery, Division of
Cardiothoracic Surgery, Emory University School
of Medicine, Atlanta, Georgia
*Endoscopic and Traditional Minimally Invasive Direct Coronary
Artery Bypass*

Edward D. Verrier, MD

Professor and Chief of Division of Cardiothoracic
Surgery, K. Alvin and Shirley Merendino Endowed
Chair of Cardiothoracic Surgery, University of
Washington Medical Center, Seattle, Washington
Aortic Homografts

译者名单

主 译 谷天祥

译 者 (以姓氏笔画为序)

(中国医科大学附属第一医院)

于 洋	于 鹏	王 春	毛乃惠
卢春茂	刘 玉	刘 波	师恩祎
江和声	李 卓	宋来春	沈春健
张玉海	房 勤	赵 晔	赵晓琪
姜大庆	钱 程	章志伟	喻 磊
程 实	管晓宇	樊国亮	

译者序言

传统的心脏手术技术在如今不断进步的科技大背景下，逐步被全新的手术技术所替代或更新。自20世纪50年代体外循环手术开展以来，短短60年里，从心脏移植到人工心脏、从姑息手术到根治手术、从开放手术到闭式微创手术等等，心脏外科随着科技的变革而日新月异。

我国心脏外科起步较欧美国家晚，改革开放后自20世纪90年代开始逐渐蓬勃发展起来。目前我国等待心脏手术的患者将近千万，而能够独立完成心脏手术的医院和外科医生相对于患者数量又十分匮乏，所以培养优秀的心脏外科医生是我国心脏外科领域的重大任务。“一幅图片等值于千言万语”，精美的专业外科图谱可以简单快速地普及专业技术和理论知识，对培养外科医生起到重要作用。我国目前尚无以全彩色图片介绍心脏外科手术技术细节的外科图谱。

Frank W. Sellke教授在心脏外科基础研究与临床手术方面造诣极高，目前担任 *Journal of Thoracic and Cardiovascular Surgery* 副主编，以及胸心外科巨著 *Sabiston and Spencer's Surgery of the Chest* 第7版和第8版的主编，在 *Circulation* 等心血管领域高水平杂志上发表SCI文章300余篇。由他和Marc Ruel教授共同主编，John R. Doty、Tirone E. David、Lawrence H. Cohn、A. Marc Gillinov、Joseph E. Bavaria、Joseph S. Coselli等众多国际著名心脏外科专家参与编写的《心脏外科手术技术图谱》，代表目前世界心脏外科手术技术的最高水平。作者以复杂的手术操作技术为切入点，全面、逐步叙述冠状动脉旁路移植、大血管置换和腔内治疗、瓣膜手术以及人工心脏等心脏手术的各个环节，融入丰富的临床经验，通俗易懂，重点突出，内含大量的精美图片，对于培养心脏外科手术医生有很好的指导和参考价值。

本书由中国医科大学附属第一医院心脏外科临床外科医生、灌注医生、监护医生翻译完成。在严格忠实于原文内容和版式的基础上兼顾中文的语言习惯，但限于外语水平和临床经验等因素，难免存在翻译谬误和不足之处，望业内同仁和各位读者不吝指正。

最后，对Frank W. Sellke教授、Elsevier公司和北京大学医学出版社所给予的帮助，以及本书参译人员的辛勤劳动和精益求精的学术精神，深表谢意和敬意。

谷天祥

中国医科大学附属第一医院

2010年9月

著者的中文版序言 (译文)

《心脏外科手术技术图谱》英文版自一年前出版，就受到广泛的好评，这至少可以通过销售量得以证实。不久前，在中国学术交流中，多名心脏外科医生都曾向我表达过对这本图谱的兴趣。如果将这本图谱译成中文，可能会帮助更多中国的外科医生。目前，中国的心脏外科医生人数已经同美国的心脏外科医生人数相当，所以我认为这将是一个可行的想法。

谷天祥教授作为此图谱的中文版主译，他不但掌握了高超的心脏外科手术技术，同时具备优秀的英语水平。因此，我邀请谷天祥教授协同Elsevier出版社的同事们共同翻译这本图谱。展现在您眼前的这本图谱就是最终的成果。我希望中文版的图谱会像英文版的一样受到欢迎。同时希望这本由许多世界级的心脏外科专家在其各自的专长领域合作完成的图谱，至少能在中国的外科医生治疗他们的患者时起到小小的帮助。

我感谢谷教授的辛勤工作和为本书翻译做出的贡献，同时感谢Elsevier出版社对此次《心脏外科手术技术图谱》中文版翻译工作的顺利进行所给予的帮助。

Frank W. Sellke, MD
Brown Medical School
Providence RI

Forward for Chinese Edition

This edition of Atlas of Cardiac Surgical Techniques was published in English about a year ago and has been well received, at least based on the number of copies sold to date. On a recent trip to China, I was asked by several cardiac surgeons for a copy of the book, and if the atlas could be translated into a Chinese language so that it would be more useful to more surgeons in China. Since there are about as many cardiac surgeons in China as there are in the United States, I thought it would be a reasonable idea.

My Chinese host, Professor Gu Tianxiang, in addition to being an outstanding technical cardiac surgeon, has an excellent command of the English language. Therefore I asked Professor Gu to help spearhead the translation with my colleagues from Elsevier. The book in front of you is the end product. I hope that this translation will be as well received as was the English version. Since this atlas was written by many of the world's experts in their respective areas of cardiac surgery, I hope that this translation will help, at least in a small way, surgeons in China to care for their patients.

I would like to thank Professor Gu for his hard work and dedication to this project, and to Elsevier to indulging me in allowing this translation of Atlas of Cardiac Surgical Techniques to go forward.

Frank W. Sellke, MD
Brown Medical School
Providence RI

原著序言

“一幅图片等值于千言万语”——匿名者

这本图谱是供外科执业医师、外科住院医师以及医学生复习和准备外科手术操作而编写的。随着技术和药理学的不断发展，手术步骤也在不断更新，新步骤取代了旧步骤。作者们通过总结外科实践中的个人经验，用图片逐步演示手术步骤，并融入术前评估、术后处理以及技术要点和注意事项等内容，充分展现了目前心脏外科手术的全貌。这些手术的效果已经在外科实践中得到验证。外科手术是一门手工艺术，融汇了外科医生的知识、判断和操作技能，最终使患者受益。完美的手术操作就是取得这种成功的钥匙。手术的速度取决于制订术前计划，并一次性投入足够的时间按顺序完成每一步。外科医生必须致力于在手术的第一时间内做出正确的决定，否则就不会有任何其他机会来花费时间改正。翻开这本图谱，为了您的患者而学习。

“业余者的不断实践是为了达到正确，而专家的不断实践是为了不会犯错。”

——匿名者

Courtney M. Townsend, Jr., MD

B. Mark Evers, MD

原著前言

心脏作为支持生命的主要器官，是一个复杂的结构。因此心脏外科相对于其他外科专业而言，是技术上绝对精尖的复杂专业，所涉及的手术不仅仅是切除，更重于对心脏组织的功能性重建。这些需要心脏外科医生修复的组织包括：血管、微血管、心肌、纤维、瓣膜、传导和结缔组织。它们是每时每刻人类生命所必需的，经不起细微的差错。例如，在冠状动脉旁路移植术、二尖瓣修复手术或自体肺动脉移植手术中，仅仅1mm的偏差就可以导致术中死亡，而准确的手术则会挽回患者几十年的生命。

心脏外科的教学与血液化验单分析或体格检查教学并不相同，心脏外科的老师必须要教会学生如何去操作，例如主动脉瓣置换手术，对于教师和学生都需要高度集中精力去完成。心脏外科对于心外科医生在操作技术和临床知识上要求很高，因此，对于传播这方面的知识，类似这本图谱的书籍起到重要作用。作为这本书的作者，我们同样受益于我们的老师，我们的目标不仅仅是提供当今最新最先进的心脏外科手术技术，同时也是传承历史。

这本书旨在成为过去、现在和未来心脏外科工作的有益补充，同时也是表达我们对那些地位常被世人低估但却为患者带来健康的的心脏外科前辈们的崇高敬意。借此，我们全体心脏外科医生诚心感谢他们中的每一位。

Frank W. Sellke, MD

Marc Ruel, MD, MPH, FRCSC

目 录

第 I 篇 基础技术

- 第 1 章 心脏手术切口 3
Munir Boodhwani 和 Marc Ruel 著
- 第 2 章 体外循环插管技术 12
Ladislaus Ressler 和 Fraser D. Rubens 著

第 II 篇 冠状动脉疾病手术

- 第 3 章 体外循环下冠状动脉旁路移植术 29
Anastasios K. Konstantakos 和 Frank W. Sellke 著
- 第 4 章 非体外循环下冠状动脉旁路移植手术 47
Sorin V. Pusca 和 John D. Puskas 著
- 第 5 章 内镜和传统的微创直视冠状动脉旁路手术 61
Thomas A. Vassiliades, Jr. 著
- 第 6 章 微创冠状动脉旁路移植手术 83
Marc Ruel, Vincent Chan, Harry Lapierre 和 Joseph T. McGinn, Jr. 著
- 第 7 章 机器人冠状动脉旁路移植手术 95
Stephan Jacobs, Volkmar Falk 和 Friedrich W. Mohr 著
- 第 8 章 心肌梗死后室间隔穿孔 106
Arvind K. Agnihotri 著

第 III 篇 瓣膜心脏病手术

- 第 9 章 主动脉瓣置换术 121
Roberto Rodriguez 和 Frank W. Sellke 著
- 第 10 章 主动脉根部扩大技术 132
John R. Doty 著
- 第 11 章 保留主动脉瓣手术 150
Tirone E. David 著
- 第 12 章 Bentall 手术 166
Richard J. Shemin 著
- 第 13 章 同种主动脉瓣置换 177
Nahush A. Mokadam 和 Edward D. Verrier 著
- 第 14 章 Ross 手术 191
Craig J. Baker 和 Vaughn A. Starnes 著

- 第 15 章 黏液性二尖瓣变性的修复 201
Lawrence H. Cohn 著
- 第 16 章 微创二尖瓣置换：部分开胸法 220
Tomislav Mihaljevic, Jason O. Robertson, Amir K. Durrani 和 A. Marc Gillinov 著
- 第 17 章 经皮二尖瓣修复技术 234
William E. Cohn 著
- 第 18 章 三尖瓣手术 246
Alexander Kulik 和 Thierry G. Mesana 著

第Ⅳ篇 主动脉疾病手术

- 第 19 章 A型主动脉夹层 265
Michael A. Coady 和 Thomas G. Gleason 著
- 第 20 章 B型主动脉夹层 282
Michael P. Fischbein, Kapil Sharma 和 R. Scott Mitchell 著
- 第 21 章 主动脉弓部瘤 296
John S. Ikonmidis 著
- 第 22 章 胸腹主动脉瘤 310
Peter I. Tsai, Scott A. LeMaire 和 Joseph S. Coselli 著
- 第 23 章 主动脉弓和降主动脉动脉瘤的腔内修复 326
Wilson Y. Szeto, William T. Brinkman 和 Joseph E. Bavaria 著

第Ⅴ篇 其他手术

- 第 24 章 心房颤动的外科治疗 351
A. Marc Gillinov 和 Tomislav Mihaljevic 著
- 第 25 章 左心室室壁瘤和重构的手术治疗 360
Lynn M. Fedoruk 和 Irving L. Kron 著
- 第 26 章 搏动血流和轴流心室辅助 373
O. H. Frazier, Igor D. Gregoric 和 William E. Cohn 著
- 第 27 章 心脏移植 391
Daniel Marelli 和 Scott Silvestry 著
- 第 28 章 心肺移植 416
Tanveer A. Khan 和 Hillel Laks 著

第 I 篇

基础技术