Rectal Prolapse
Diagnosis and Clinical Management
Editors

Donato F. Altomare
Department of Emergency and Organ Transplantation
General Surgery and Liver Transplantation Unit
University of Bari
Bari, Italy

Filippo Pucciani
Department of Medical and Surgical Critical Care
University of Florence
Florence, Italy

Library of Congress Control Number: 2007933189


Springer is part of Springer Science+Business Media
springer.com
© Springer-Verlag Italia 2008

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilm or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the Italian Copyright Law in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the Italian Copyright Law.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Product liability: The publishers cannot guarantee the accuracy of any information about dosage and application contained in this book. In every individual case the user must check such information by consulting the relevant literature.

Cover layout: Simona Colombo, Milan, Italy
Typesetting: Compostudio, Cernusco s/N (Milan), Italy
Printing: Arti Grafiche Nidasio, Assago, Italy

Printed in Italy
Springer-Verlag Italia S.r.l., Via Decembrio 28, I-20137 Milan, Italy
Rectal Prolapse: Diagnosis and Clinical Management is a unique publication. It is a multiauthor work edited by experts who have drawn together opinions by professionals highly recognised in the field. The book deals with a common condition in all its aspects – from aetiology and pathophysiology to treatment by the numerous available methods. The incidence of rectal prolapse will increase with the ageing population. In the young, functional defecation disorders sometimes associated with prolapse are frequently seen in colorectal practice and are an important cause of morbidity. For these reasons, the wide-ranging and detailed account of the subject contained within its pages makes the book particularly valuable. The contents give extensive information on the causes of prolapse and its investigation and treatment. In doing so, the editors have included contributors from home and abroad who have national and international standing. The concentrated experience that this offers is of the highest order.

The book deals comprehensively with the various forms of prolapse, including external prolapse, rectal intussusception and genital prolapse. Our understanding of the pathophysiology of rectal prolapse has advanced in the last 10–20 years due to the application of more sophisticated methods of neurophysiological assessment and of technical developments in imaging. The chapters on aetiology and investigation set out in detail the present position regarding the value of these advancements in clinical practice. The interface between rectal and genital prolapse is dealt with, as is the relationship of rectal prolapse to other anorectal symptoms such as incontinence and evacuation difficulty. The various abdominal and perineal procedures, including laparoscopic rectopexy, are described in separate chapters. Besides the classic operations, new treatments such as the STARR and EXPRESS procedures are dealt with, and their indications are considered in relation to the clinical presentation and the various other options. There is discussion on the relative merits of abdominal and perineal surgical approaches. Function following surgery receives considerable attention, and the difficult problems that may be posed by recurrence after surgery are dealt with. Nonsurgical treatment and rehabilitation are also described. There are chapters outlining best practice and a treatment algorithm that, being evidence based, set a standard of management guiding the reader through the decision-making process.

The book is beautifully laid out. The illustrations are exceptional. They include high-quality operative colour photographs and line drawings that demonstrate clearly the relevant stages of the procedure in question.

Rectal Prolapse: Diagnosis and Clinical Management gives a detailed and authoritative statement of current best practice through a wide-ranging account of all aspects of the condition. There is no other book on the subject that does so in such depth. The extensive bibliography will be a valuable resource to all practitioners involved in managing rectal prolapse, as well as to research workers in the field of functional bowel disease. The book should appeal not only to surgeons but also to gastroenterologists, physiologists and radiologists – whether in training or in established consultant practice.

London, September 2007

Prof. John Nicholls, MD
Emeritus Consultant Surgeon
St. Mark’s Hospital
Professor of Colorectal Surgery
Imperial College, London
The treatment of rectal prolapse encompasses hundreds of different operations, and despite being known and studied for millennia, the subject still creates controversy. Never, since its first recorded description in the Eber papyrus of 1500 BC has so much attention and research, so much passion and discussion, been focused on this problem. Yet, the pathophysiologic bases of this condition remain elusive; the superiority of one technique over another unclear.

The surgical landscape for rectal prolapse has recently expanded to include new treatments such as the STARR and EXPRESS procedures. The apparent effectiveness of these new techniques has allowed greater insight into the understanding of the role of intussusception in the development of rectal procidentia. Conversely, these procedures have raised new questions and stirred an ongoing global controversy. If these operations are as effective as claimed, should we then operate on all patients presenting with obstructed defecation and internal intussusception? Will this prevent the development of rectal procidentia? Will the resulting rearranged pelvic anatomy prevent prolapse recurrence? Alternatively, will the same pathophysiologic mechanism that generated the prolapse in the first place, and which may not have been addressed, lead to recurrence? The answers are clearly not yet available, and long-term follow-up will hopefully assist us in the near future to attain those answers.

Furthermore, technical details, indications, and outcomes of these new techniques are not widely understood. Clearly, no significant comparison can be made if uniformity of indications, techniques, and goals is missing. No publication so far has extensively treated these issues; therefore, the majority of surgeons and almost all nonsurgical physicians involved in the treatment of rectal prolapse have no comprehensive and effective knowledge of the new operations. The richness and variety of choices for treating rectal prolapse may become confusing, and controversy may be paralyzing when dealing with a problem about which our understanding remains somewhat obscure.

These are some reasons many surgeons felt the need for one articulate and comprehensive volume that presented an all-inclusive understanding of the pathophysiology of rectal prolapse and state-of-the-art surgical treatment for it. There is, in fact, the obvious necessity to understand new techniques and perhaps the need to weed out old procedures that offer nothing other than a historical perspective in the understanding and treatment of this condition.

This daunting task was taken up by the editors and contributing authors of this book and implemented in an authoritative and concise fashion. Rectal Prolapse: Diagnosis and Clinical Management offers a body of information encompassing any aspect of pathophysiology, diagnosis, and treatment of rectal prolapse. It is a meticulous, exhaustive review of what is established, what is new, and what we should know about rectal prolapse and its treatment.

Rectal prolapse is routinely treated in colorectal surgery textbooks as a separate entity without any deep, comprehensive discussion of the pathophysiologic antecedents that lead to its development. This book details the current understanding of prolapse mechanisms as well as the long process of anatomic and physiologic changes and symptoms that lead to rectal procidentia and fecal incontinence. Several different treatment procedures – surgical and nonsurgical – are listed and technically described, as are their results. Each procedure is treated in separate, logically laid-out chapters, with constant reference to the pathophysiological processes of rectal prolapse.

Rarely, if ever, in a textbook have obstructed defecation, intussusception, and rectal prolapse been addressed together in a comprehensive and coordinated fashion in the attempt to understand the inter-
relations that tie these three entities together. The editors and authors of this book have successfully achieved that goal and provided this missing link. The layout is beautiful, and the illustrations are precise to the smallest detail. The pool of contributors includes some of the most authoritative experts on the subject in the world, and whereas colorectal surgeons everywhere will benefit the most from this book, it is a valuable resource to all health care professionals who deal with such patients.

Miami, October 2007

Prof. Floriano Marchetti MD
Assistant Professor of Clinical Surgery
Division of Colon and Rectal Surgery
DeWitt Daughtry Family Department of Surgery
Miller School of Medicine
University of Miami
Miami, FL, USA

Prof. Stanley M. Goldberg MD, FACS
Clinical Professor of Surgery
Division of Colon and Rectal Surgery
Department of Surgery
University of Minnesota
Minneapolis, MN, USA
# Contents

## SECTION I  Rectal Prolapse: Anatomy, Pathophysiology and Imaging

1. **Perineum: Functional Anatomy** ................................................................. 3  
   *R. De Caro, A. Porzionato, V. Macchi*

2. **Rectal Prolapse: Pathophysiology** ......................................................... 13  
   *F. Pucciani*

3. **Functional Imaging in Rectal Prolapse** ................................................. 21  
   *V.L. Piloni, A. Bazzocchi, R. Golfieri*

4. **An Overview of Neurophysiologic Tests in Rectal Prolapse** ...................... 33  
   *C. Ratto*

5. **Classification of Internal and External Rectal Prolapse** ......................... 41  
   *F. Pomerri, P.C. Muzzio*

## SECTION II  Internal Prolapse

6. **Rehabilitative Treatment for Internal Rectal Prolapse** ............................ 53  
   *F. Pucciani*

7. **Treatment of Internal Rectal Prolapse by Rectopexy** .............................. 57  
   *H.M. Paterson, D.C.C. Bartolo*

8. **Treatment of Rectal Intussusception by Internal Delorme Procedure** ........ 63  
   *E. Ganio, I. Giani*

9. **The STARR Procedure for Internal Rectal Prolapse** ............................... 71  
   *P.-A. Lehur, G. Meurette, M. La Torre*

10. **The EXPRESS Procedure for Internal Rectal Prolapse** ........................... 81  
    *P. Giordano, N.S. Williams*

## SECTION III  External Prolapse

11. **Perineal Approach to External Rectal Prolapse: The Delorme Procedure** .... 89  
    *G.A. Binda, A. Serventi*

12. **Perineal Approach to External Rectal Prolapse: The Altemeier Procedure** .. 97  
    *D.F. Altomare, M. Rinaldi*
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Surgery for Rectal Prolapse: Functional Outcome from the Perineal</td>
<td>S.D. Wexner, A. Khanna</td>
</tr>
<tr>
<td></td>
<td>Approach – An Overview</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Surgical Treatment of Rectal Prolapse: Rectopexy without Mesh</td>
<td>R. Bergamaschi, M. Fealk</td>
</tr>
<tr>
<td>15</td>
<td>Mesh Rectopexy: The Wells Technique</td>
<td>A.P. Zbar</td>
</tr>
<tr>
<td>16</td>
<td>Rectopexy with Mesh According to the Ripstein Technique</td>
<td>V. Sohn, S.R. Steele, A. Mellgren</td>
</tr>
<tr>
<td>17</td>
<td>Rectopexy with Mesh: The Orr-Loygue Technique</td>
<td>A. Infantino, R. Belloma, D. Del Ciampo</td>
</tr>
<tr>
<td>18</td>
<td>Rectopexy According to Frykman-Goldberg Technique</td>
<td>G.G. Delaini, G. Colucci</td>
</tr>
<tr>
<td>19</td>
<td>Laparoscopic Ventral Rectocolpopexy for Complex Rectogenital Prolapse</td>
<td>A. D’Hoore, F. Penninckx</td>
</tr>
<tr>
<td>20</td>
<td>Management of Rectal Prolapse: The Role of Laparoscopic Approaches</td>
<td>D.R. Metcalf, A.J. Senagore</td>
</tr>
<tr>
<td>21</td>
<td>Surgery for Rectal Prolapse: Functional Outcome from the Abdominal</td>
<td>L. Påhlman, U. Karlbom</td>
</tr>
<tr>
<td></td>
<td>Approach - An Overview</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>The Management of Recurrent Rectal Prolapse</td>
<td>R. Madoff, J.W. Ogilvie Jr., S.R. Steele</td>
</tr>
<tr>
<td>23</td>
<td>Surgery for Rectal Prolapse: General Criteria for the Selection</td>
<td>G. Romano, F. Bianco, L. Caggiano</td>
</tr>
<tr>
<td></td>
<td>of the Best Treatment</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Management of Associated Pelvic Dysfunctions: External Rectal</td>
<td>G. Dodi, L. Amadio</td>
</tr>
<tr>
<td></td>
<td>Prolapse and Faecal Incontinence</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Management of Associated Pelvic Dysfunctions: External Rectal</td>
<td>M. Cervigni, F. Natale, A. Padoa</td>
</tr>
<tr>
<td></td>
<td>Prolapse and Genital Prolapse</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Management Guidelines for Full-thickness Rectal Prolapse</td>
<td>A.P. Zbar, H. Nguyen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subject Index</td>
<td></td>
</tr>
</tbody>
</table>
Contributors

Donato F. Altomare
Department of Emergency and Organ Transplantation
University of Bari
Bari, Italy

Luca Amadio
Department of Surgery
University of Padua
Padua, Italy

David C.C. Bartolo
Western General Hospital
Edinburgh, United Kingdom

Alberto Bazzocchi
Department of Radiology
Pelvic Floor Imaging Centre
Radiologia Golfieri
Malpighi-S-Orsola Hospital
Bologna, Italy

Roberto Bellomo
Department of Surgery
Civil Hospital
San Vito al Tagliamento (PN), Italy

Roberto Bergamaschi
Department of Surgery
Lehigh Valley Hospital
Penn State University Campus
Allentown, PA, USA

Francesco Bianco
Department of Surgery I
“S.G. Moscati” Hospital
Avellino, Italy

Gian Andrea Binda
Department of Surgery
Galliera Hospital
Genoa, Italy

Luisa Caggiano
Department of Surgery I
“S.G. Moscati” Hospital
Avellino, Italy

Mauro Cervigni
Department of Urogynecology
S. Carlo - IDI Hospital
Rome, Italy

Gianluca Colucci
Department of Surgery and Gastroenterology
University of Verona
Verona, Italy

Gian Gaetano Delaini
Department of Surgery and Gastroenterology
University of Verona
Verona, Italy

Raffaele De Caro
Department of Human Anatomy and Physiology
School of Medicine
University of Padua
Padua, Italy

Domenico Del Ciampo
Department of Surgery
Civil Hospital
San Vito al Tagliamento (PN), Italy

Giuseppe Dodi
Department of Surgery
University of Padua
Padua, Italy

Andre D’Hoore
Department of Abdominal Surgery
University Hospital Gasthuisberg
Leuven, Belgium
Michael Fealk
Department of Surgery
Lehigh Valley Hospital
Allentown, PA, USA

Ezio Ganio
Colorectal Eporediensis Centre
Department of Colorectal Surgery
Monza, Italy

Iacopo Giani
Department of Medical and Surgical Care
University of Florence
Florence, Italy

Pasquale Giordano
Department of Surgery
Whipps Cross University Hospital
London, United Kingdom

Rita Golfieri
Department of Radiology
Pelvic Floor Imaging Centre
Radiologia Golfieri
Malpighi-S-Orsola Hospital
Bologna, Italy

Aldo Infantino
Department of Surgery
Civil Hospital
San Vito al Tagliamento (PN), Italy

Urban Karlbom
Department of Surgery
University Hospital
Uppsala, Sweden

Amit Khanna
Department of Colorectal Surgery
Cleveland Clinic Florida
Weston, FL, USA

Marco La Torre
Department of Digestive and Endocrine Surgery
Hôtel-Dieu
University Hospital of Nantes
Nantes, France

Paul-Antoine Lehur
Department of Digestive and Endocrine Surgery
Hôtel-Dieu
University Hospital of Nantes
Nantes, France

Veronica Macchi
Department of Human Anatomy and Physiology
School of Medicine
University of Padua
Padua, Italy

Robert D. Madoff
Department of Surgery
Division of Colon and Rectal Surgery
University of Minnesota
Minneapolis, MN, USA

Anders Mellgren
Division of Colon and Rectal Surgery
University of Minnesota
Minneapolis, MN, USA

Dan R. Metcalf
Spectrum Health
Ferguson Clinic
Grand Rapids, MI, USA

Guillaume Meurette
Department of Digestive and Endocrine Surgery
Hôtel-Dieu
University Hospital of Nantes
Nantes, France

Pier Carlo Muzzio
IRCCS-Istituto Oncologico Veneto and
Department of Medical Diagnostic Sciences and
Special Therapies, Radiology
University Hospital
Padua, Italy

Franca Natale
Department of Urogynecology
S. Carlo - IDI Hospital
Rome, Italy

Hung Nguyen
Department of Surgery
Launceston General Hospital
Launceston, TAS, Australia

James W. Ogilvie Jr.
Department of Surgery
Division of Colon and Rectal Surgery
University of Minnesota
Minneapolis, MN, USA

Anna Padoa
Department of Obstetrics and Gynecology
Assaf Harofe Medical Center
Zrifin, Israel
Lars Påhlman
Department of Surgery
University Hospital
Uppsala, Sweden

Hugh M. Paterson
Department of Colorectal Surgery
Western General Hospital
Edinburgh, United Kingdom

Freddy Penninckx
Department of Abdominal Surgery
University Hospital Gasthuisberg
Leuven, Belgium

Vittorio L. Piloni
Department of Radiology
Pelvic Floor Imaging Centre
Radiologia Golfieri
Malpighi-S-Orsola Hospital
Bologna, Italy

Fabio Pomerri
Department of Medical Diagnostic Sciences and
Special Therapies, Radiology
University Hospital
Padua, Italy

Andrea Porzionato
Department of Human Anatomy and Physiology
School of Medicine
University of Padua
Padua, Italy

Filippo Pucciani
Department of Medical and Surgical Critical Care
University of Florence
Florence, Italy

Carlo Ratto
Department of Surgical Sciences
Division of Digestive Surgery
Catholic University
Rome, Italy

Marcella Rinaldi
Department of Emergency and
Organ Transplantation
University of Bari
Bari, Italy

Giovanni Romano
Department of Surgery I
“S.G. Moscati” Hospital
Avellino, Italy

Anthony J. Senagore
Spectrum Health
Ferguson Clinic
Grand Rapids, MI, USA

Alberto Serventi
Department of Surgery
Galliera Hospital
Genoa, Italy

Vance Sohn
Department of Surgery
Madigan Army Medical Center
Tacoma, WA, USA

Scott R. Steele
Department of Surgery
Madigan Army Medical Center
Tacoma, WA, USA

Steven D. Wexner
Department of Colorectal Surgery
Ohio State University and
Department of Surgery
University of South Florida College of Medicine
Cleveland Clinic Florida
Weston, FL, USA

Norman S. Williams
Centre for Academic Surgery
The Royal London Hospital
London, United Kingdom

Andrew P. Zbar
School of Clinical of Human Life Sciences
University of Tasmania
Launceston, TAS, Australia