

Contents

VOLUME 1

SECTION I

Esophagus and Hernia

PART ONE

Anatomy and Physiology of the Esophagus

1 Esophageal Sphincters in Health and Disease 2

Karl Hermann Fuchs, Benjamin Babic, and Hans Friedrich Fuchs

2 Esophageal Body in Health and Disease 11

Marco E. Allaix and Marco G. Patti

3 Esophageal Mucosa in Health and Disease 15

Parakrama Chandrasoma, Yanling Ma, and Evan E. Yung

4 Relevant Anatomic Relations of the Esophagus 31

Jules Lin

PART TWO

Diagnostic Evaluation of the Esophagus

5 Esophageal Symptoms and Selection of Diagnostic Tests 44

Ross M. Bremner and Sumeet K. Mittal

6 Radiology of the Esophagus: Barium, Computed Tomography Scan, Positron Emission Tomography Scan, Magnetic Resonance Imaging 57

John M. Barlow, Daniel A. Craig, Val J. Lowe, and Robert L. MacCarty

7 Endoscopic Evaluation of the Esophagus and Endoscopic Ultrasonography of the Esophagus 85

Daniel S. Oh, Stuart Jon Spechler, Jacques Bergman, Thomas W. Rice, and Gregory Zuccaro Jr.

8 High-Resolution Esophageal Manometry: Techniques and Use in the Diagnosis of Esophageal Motility Disorders and for Surgical Decision Making 115

Ezra N. Teitelbaum and Christy M. Dunst

9 pH and Impedance Evaluation of the Esophagus 129

Geoffrey P. Kohn

10 Novel Diagnostic Technologies: Mucosal Impedance, Optical Coherence Tomography, Endomicroscopy 141

Fahim Habib and Blair A. Jobe

PART THREE

Esophageal Motility Disorders and Diverticula

11 Cricopharyngeal Dysfunction and Zenker Diverticulum 157

Giovanni Zaninotto and Mario Costantini

12 Surgical Management of Mid- and Distal Esophageal Diverticula 173

Brian E. Louie, Shane P. Smith, and Oliver C. Bellevue

13 Epidemiology, Diagnosis, and Medical Management of Achalasia 184

Edy Soffer

14 Endoscopic and Surgical Therapies for Achalasia 189

Paul D. Colavita and Lee L. Swanstrom

PART FOUR

Gastroesophageal Reflux Disease

15 Gastroesophageal Reflux Disease: Definition and Scope of the Problem in the United States of America and Worldwide 197

Joshua Sloan and Philip O. Katz

16 Etiology and Natural History of Gastroesophageal Reflux Disease and Predictors of Progressive Disease 204

Tom R. DeMeester

17 Respiratory Complications of Gastroesophageal Reflux Disease 221

Michael S. Mulvihill, Shu S. Lin, and Matthew G. Hartwig

18 Acid-Suppression Therapy for Gastroesophageal Reflux Disease and the Therapeutic Gap 228

Leila Kia and Peter J. Kahrilas

19 Fundoplication for Gastroesophageal Reflux Disease 234

Joel M. Sternbach and Nathaniel J. Soper

20 Magnetic Sphincter Augmentation for Gastroesophageal Reflux Disease 248

Luigi Bonavina and Emanuele Asti

21 Endoscopic Management of Gastroesophageal Reflux Disease 253

Aaron Richman, Praveen Sridhar, and Hiran C. Fernando

22 Options to Address Delayed Gastric Emptying in Gastroesophageal Reflux Disease 262

John C. Lipham and Kulmeet K. Sandhu

23 Management of Failed Funduplications, End-Stage Gastroesophageal Reflux Disease, and Scleroderma 269

Hugh G. Auchincloss and David W. Rattner

24 Esophageal Complications of Bariatric Procedures 277

Joerg Zehetner

PART FIVE

Paraesophageal Hernia

25 Paraesophageal Hernia: Etiology, Presentation, and Indications for Repair 279

Jorge A. Vega Jr. and Vic Velanovich

26 Laparoscopic Paraesophageal Hernia Repair: Technique, Outcomes, and Management of Complications 284

Lara W. Schaheen, Ian Christie, and James D. Luketich

27 Open Paraesophageal Hernia Repair 291

Daniel L. Miller

28 Diaphragmatic Relaxing Incisions for Crural Tension During Hiatal Hernia Repair 301

Marc A. Ward and Steven R. DeMeester

29 Collis Gastroplasty for a Foreshortened Esophagus 305

Stephanie G. Worrell, Joshua A. Boys, and Steven R. DeMeester

30 Mesh at the Hiatus 308

Sumeet K. Mittal and Ross M. Bremner

PART SIX**Barrett Esophagus**

- 31 Controversies in the Definition of Barrett Esophagus 314**

Thomas J. Watson

- 32 Epidemiology of Barrett Esophagus and Risk Factors for Progression 323**

Oliver M. Fisher and Reginald V.N. Lord

- 33 Medical and Surgical Therapy for Gastroesophageal Reflux Disease and Barrett Esophagus 339**

Mark R. Wendling and Brant K. Oelschlager

- 34 Ablation for Patients With Barrett or Dysplasia 350**

B. Mark Smithers and Iain Thomson

PART SEVEN**Esophageal Cancer**

- 35 Epidemiology, Risk Factors, and Clinical Manifestations of Esophageal Cancer 362**

Talar Tatarian and Francesco Palazzo

- 36 Esophageal Cancer Diagnosis and Staging 368**

Mustapha El Lakis and Donald E. Low

- 37 Endoscopic Management of High-Grade Dysplasia and Superficial Esophageal Carcinoma 382**

Wayne L. Hofstetter, Raquel E. Davila, and Marta L. Davila

- 38 Multimodality Therapy in the Management of Locally Advanced Esophageal Cancer 391**

Jonathan Cools-Lartigue and Lorenzo Ferri

- 39A Surgical Approaches to Remove the Esophagus: Open 405**

B.J. Noordman, S.M. Lagarde, B.P.L. Wijnhoven, and J.J.B. van Lanschot

- 39B Surgical Approaches to Remove the Esophagus: Minimally Invasive 415**

Arianna Barbetta and Daniela Molena

- 39C Surgical Approaches to Remove the Esophagus: Vagal-Sparing 421**

Steven R. DeMeester

- 39D Surgical Approaches to Remove the Esophagus: Robotic 424**

Benjamin Wei and Robert J. Cerfolio

- 40 Extent of Lymphadenectomy for Esophageal Cancer 431**

Alexander W. Phillips and S. Michael Griffin

- 41 Options for Esophageal Replacement 438**

Lieven Depypere, Hans Van Veer, Philippe Robert Nafteux, Willy Coosemans, and Toni Lerut

- 42 Palliative Therapy for Esophageal Cancer 467**

Dennis Wells and Virginia R. Little

- 43 Anastomotic Complications After Esophagectomy: Frequency, Prevention, and Management 473**

Tamar B. Nobel, Jessica G.Y. Luc, and Daniela Molena

PART EIGHT**Miscellaneous Esophageal Conditions**

- 44 Nonreflux Esophagitis 480**

Deacon J. Lile, Ryan Moore, and Abbas E. Abbas

- 45 Esophageal Duplication Cyst 490**

Ching Yeung, Blair MacDonald, and Sebastien Gilbert

- 46 Submucosal Tumors of the Esophagus and Gastroesophageal Junction 496**

Kristin Wilson Beard and Kevin M. Reavis

- 47 Caustic Esophageal Injury 515**

Daniel French and Sudhir Sundaresan

48 Etiology and Management of Esophageal Perforation 526

Thomas J. Watson and Christian G. Peyre

49 Management of Esophageal Perforations and Leaks 536

Erin Gillaspie and Shanda H. Blackmon

PART NINE

Hernia

50 Basic Concepts and Factors Associated With Ventral Hernia Recurrence 548

Crystal F. Totten and J. Scott Roth

51 Congenital Diaphragmatic Hernia 561

Craig Albanese and Chad M. Thorson

52 Ventral Hernia and Abdominal Release Procedures 571

Heidi J. Miller and Yuri W. Novitsky

53A Inguinal Hernia Repair: Laparoscopic 590

Namir Katkhouda, Kulmeet K. Sandhu, Kamran Samakar, and Evan Alicuben

53B Inguinal Hernia Repair: Open 599

Kamran Samakar, Kulmeet K. Sandhu, and Namir Katkhouda

54 Lumbar, Pelvic, and Uncommon Hernias 606

Kais Rona and Nikolai A. Bildzukewicz

55 Mesh: Material Science of Hernia Repair 621

Samuel Wade Ross and David A. Iannitti

SECTION II

Stomach and Small Intestine

56 Anatomy and Physiology of the Stomach 634

Rickesha L. Wilson and Christina E. Stevenson

57 Diagnostic and Therapeutic Endoscopy of the Stomach and Small Bowel 647

Chao Li and James Ellsmere

58 Access and Intubation of the Stomach and Small Intestine 663

David S. Shapiro and Stephanie C. Montgomery

59 Surgery for Peptic Ulcer Disease 673

Abubaker Ali, Bestoun H. Ahmed, and Michael S. Nussbaum

60 Zollinger-Ellison Syndrome 702

Mary E. Dillhoff and E. Christopher Ellison

61 Gastric Adenocarcinoma 712

Kevin E. Behrns and Jessica L. Cioffi

62 Postgastrectomy Syndromes 719

Kristoffel Dumon and Daniel T. Dempsey

63 Operations for Morbid Obesity 735

Bruce Schirmer

64 Foreign Bodies and Bezoars of the Stomach and Small Intestine 750

Stephanie Scurci and Robert Kozol

65 Motility Disorders of the Stomach and Small Intestine 755

Justin Barr and Rebekah R. White

66 Miscellaneous Benign Lesions and Conditions of the Stomach, Duodenum, and Small Intestine 764

David B. Adams and Katherine A. Morgan

67 Surgical Disease of the Stomach and Duodenum in Infants and Children 770

Paul M. Jeziorczak, Alice King, and Brad W. Warner

68 Anatomy and Physiology of the Duodenum 786

Brian Shames

69 Adenocarcinoma of the Small Intestine 804

Shrawan G. Gaitonde and Anton J. Bilchik

70 Reoperations on the Stomach and Duodenum 809

Morgan Bonds, Alessandra Landmann, and Russell Postier

71 Anatomy and Physiology of the Small Intestine 817

Jacob Campbell, James Berry, and Yu Liang

72 Small Bowel Obstruction 842

Lily E. Johnston and John B. Hanks

73 Volvulus of the Stomach and Small Bowel 851

Riaz Cassim

74 Internal Hernias: Congenital and Acquired 858

Justin Wilkes and Joseph J. Cullen

75 Crohn Disease and Its Surgical Management 864

Christy Cauley and Richard Hodin

76 Gastric, Duodenal, and Small Intestinal Fistulas 886

Michael S. Nussbaum and David W. McFadden

77 Small Bowel Diverticula 908

Hadley K.H. Wesson, Karen R. Natoli, James E. Harris Jr., and Michael E. Zenilman

78 Radiation Enteritis 914

Asish D. Patel and Jon S. Thompson

79 Short Bowel Syndrome 920

Magesh Sundaram and John Kim

80 Gastrointestinal Carcinoid Tumors 939

Linda Barry and David W. McFadden

81 Gastrointestinal Stromal Tumors 951

Bruce M. Brenner

82 Gastrointestinal Lymphomas 960

Nathan Bolton, William Conway, and John Bolton

83 Surgical Conditions of the Small Intestine in Infants and Children 970

Yue-Yung Hu, Todd Jensen, and Christine Finck

84 Ileostomy 991

Vikram B. Reddy and Walter E. Longo

85 Suturing, Stapling, and Tissue Adhesion 1005

David Giles and Ethan Talbot

86 Anatomy and Physiology of the Mesenteric Circulation 1014

Pamela Zimmerman, Khumara Huseynova, and Lakshmikumar Pillai

87 Mesenteric Ischemia 1027

Adam Cloud, John N. Dussel, Carissa Webster-Lake, and Jeffrey Indes

88 Aortoenteric Fistula and Visceral Artery Aneurysms 1040

Micah Girotti and Melina R. Kibbe

89 Mesenteric Arterial Trauma 1056

Eric N. Klein and Orlando C. Kirton

VOLUME 2

SECTION III

Pancreas, Biliary Tract,
Liver, and Spleen

PART ONE

Pancreas

90 Anatomy, Physiology, and Embryology of the
Pancreas 1062

Joseph Fusco, Yousef El-Gohary, and George K. Gittes

91 Acute Pancreatitis 1076

Stefan A.W. Bouwense, Hein G. Gooszen,
Hjalmar C. van Santvoort, and Marc G.H. Besselink

92 Chronic Pancreatitis 1085

Jennifer Tseng, Eugene A. Choi, and Jeffrey B. Matthews

93 Pseudocysts and Other Complications
of Pancreatitis 1097

Stephen M. Doane and Charles J. Yeo

94 Endoscopic and Minimally Invasive Therapy
for Complications of Pancreatitis 1113Christopher G. Chapman, Irving Waxman, and
Vivek N. Prachand95 Imaging and Radiologic Intervention in
the Pancreas 1127

Melvy S. Mathew, Brian Funaki, and Aytakin Oto

96 Pancreatic and Periapillary Cancer 1136

Katherine E. Poruk, James F. Griffin,
Christopher L. Wolfgang, and John L. Cameron97 Neuroendocrine Tumors of the
Pancreas 1149

Daniela P. Ladner and Jeffrey A. Norton

98 Primary Pancreatic Cystic Neoplasms 1158

Andrew Schneider and Kevin K. Roggin

99 Unusual Pancreatic Tumors 1172

Elliot A. Asare, Huamin Wang, Eric P. Tamm,
Melinda M. Mortenson, Douglas B. Evans, and
Susan Tsai100 Techniques of Pancreatic Resection
for Cancer 1181

Kevin C. Soares and Timothy M. Pawlik

101 Minimally Invasive Pancreas Surgery 1193

Vernissia Tam, Deepa Magge, Herbert Zeh III, and
Melissa Hogg

102 Pancreatic Trauma 1208

Syed Nabeel Zafar, Edward E. Cornwell III, and
Adil A. Shah103 Pancreatic Problems in Infants
and Children 1215

Noor Kassira, Carrie A. Laituri, and Charles N. Paidas

104 Pancreas and Islet Allograft Transplantation 1226

Piotr Witkowski, Julia Solomina, and J. Michael Millis

105 Prevention and Management of Complications
of Pancreatic Surgery 1239Mark P. Callery, Manuel Castillo-Angeles, and
Tara Sotsky Kent

PART TWO

Biliary Tract

106 Anatomy, Embryology, Anomalies, and
Physiology of the Biliary Tract 1249

Pierre F. Saldinger and Omar E. Bellorin-Marín

107 Imaging and Radiologic Intervention in the
Biliary Tract 1267Rakesh Navuluri, Brian Funaki, Danial Jilani, Tom Tullius,
Mikin Patel, Ashley Altman, Comerón Ghobadi, and
Arun Nagaraju108 Operative Management of Cholecystitis
and Cholelithiasis 1280

Alexander Perez and Theodore N. Pappas

109 Management of Common Bile Duct Stones 1286

Ben Schwab, Eric S. Hungness, and Nathaniel J. Soper

110 Biliary Dyskinesia and Sphincter of Oddi Dysfunction 1294

Katherine A. Morgan and David B. Adams

111 Endoscopic Evaluation and Management of Pancreaticobiliary Disease 1300

Christopher G. Chapman, Nayna A. Lodhia, Maricarmen Manzano, and Irving Waxman

112 Biliary Tract Tumors 1323

Susanne G. Warner, Clifford S. Cho, and Yuman Fong

113 Prevention and Management of Bile Duct Injury 1340

Chad G. Ball and Keith D. Lillemoe

114 Operative Management of Bile Duct Strictures 1352

Karen A. Chojnacki and Charles J. Yeo

115 Biliary Atresia and Biliary Hypoplasia 1361

Stephen P. Dunn

116 Cystic Disorders of the Bile Ducts 1367

Hisami Ando and Tadahiro Takada

117 Surgical Treatment of Primary Sclerosing Cholangitis 1378

Kristopher P. Croome, Gregory J. Gores, and Charles B. Rosen

PART THREE

Liver

118 Anatomy and Physiology of the Liver 1386

Adam S. Bodzin and Talia B. Baker

119 Laboratory Measurement of Hepatic Function 1398

Helen S. Te

120 Perioperative Management and Nutritional Support in Patients With Liver and Biliary Tract Disease 1410

Joseph DiNorcia and Steven D. Colquhoun

121 Hepatic Cysts 1420

Hari Nathan and Michael W. Mulholland

122 Liver Abscess 1430

Eliza W. Beal and Sylvester M. Black

123 Management of Hepatobiliary Trauma 1446

Michael D. Goodman and Timothy A. Pritts

124 Diagnostic Operation of the Liver and Techniques of Hepatic Resection 1456

Alessandro Paniccia and Richard D. Schulick

125 Minimally Invasive Techniques of Hepatic Resection 1472

Iswanto Sucandy, Susannah Cheek, and David A. Geller

126 Ablative Therapies for Hepatic Neoplasms 1481

David A. Mahvi and David M. Mahvi

127 Hepatic Transplantation 1488

Nicholas N. Nissen, Alagappan Annamalai, and Andrew Klein

128 Acute Liver Failure and Bioartificial Liver Support 1508

Harvey S. Chen, Jian Yang, and Scott L. Nyberg

129 Vascular Diseases of the Liver 1517

David M. Levi and Andreas G. Tzakis

130 Drug-Induced Liver Injury 1524

Anurag Maheshwari and Sagar Ranka

131 Benign Hepatic Neoplasms 1532

L.F. Grochola, Henrik Petrowsky, and Pierre-Alain Clavien

132 Hepatocellular Carcinoma 1541

Garrett Richard Roll and John Paul Roberts

133 Management of Primary Malignant Hepatic Neoplasms Other Than Hepatocellular Cancer 1556

Epameinondas Dogeas and Michael A. Choti

134 Management of Secondary Hepatic Neoplasms 1565

Juan Camilo Barreto and Mitchell C. Posner

135 Management of Portal Hypertension 1575

Alex L. Chang and Shimul A. Shah

PART FOUR

Spleen

136 Anatomy and Physiology of the Spleen 1591

Luise I.M. Pernar and Ali Tavakkoli

137 Technique of Splenectomy 1598

Megan Jenkins, Manish Parikh, and H. Leon Pachter

138 Minimally Invasive Surgical and Image-Guided Interventional Approaches to the Spleen 1603

Ciro Andolfi and Jeffrey B. Matthews

139 Management of Splenic Trauma in Adults 1622

Sara A. Mansfield and Amy P. Rushing

140 Splenic Trauma in Children 1626

Grace Z. Mak

141 Splenectomy for Conditions Other Than Trauma 1635

Rory L. Smoot, Mark J. Truty, and David M. Nagorney

142 Cysts and Tumors of the Spleen 1654

David T. Pointer Jr. and Douglas P. Slakey

SECTION IV

Colon, Rectum, and Anus

PART ONE

Anatomy, Physiology, and Diagnosis of Colorectal and Anal Diseases

143 Operative Anatomy of the Colon, Rectum, and Anus 1662

Matthew P. Kelley, Jonathan Efron, Sandy H. Fang, Bashar Safar, and Susan Gearhart

144 Physiology of the Colon and Its Measurement 1676

Adil E. Bharucha and Michael Camilleri

145 Diagnostic and Therapeutic Colonoscopy 1689

Shaun R. Brown, Terry C. Hicks, and Charles B. Whitlow

146 Magnetic Resonance Imaging Staging of Rectal Cancer 1700

Warren E. Lichliter, Gregory dePrisco, James W. Fleshman, and Andrew H. Lichliter

147 Ultrasonographic Diagnosis of Anorectal Disease 1713

Elisa Birnbaum

PART TWO

Benign Colon, Rectal, and Anal Conditions

148 Diagnosis and Management of Fecal Incontinence 1721

Janet T. Lee, Sarah A. Vogler, and Robert D. Madoff

149 Surgical Treatment of Dysmotility Disorders of the Colon 1733

David J. Maron and Steven D. Wexner

- 150 Pelvic Floor Dysfunction 1750**
Matthew Silveira and Deborah S. Keller
- 151 Rectovaginal and Rectourethral
Fistulas 1761**
Joshua I.S. Bleier and Robert Caleb Kovell
- 152 Current Approaches to Complete Rectal
Prolapse and Internal Intussusception 1781**
Isaac Payne, Gregory Quatrino, Paul Rider, and
Leander Grimm Jr.
- 153 Pilonidal Disease and Perianal
Hidradenitis 1790**
Katerina Wells and Michael Pendola
- 154 Emergent Care of the Victim of
Colorectal Trauma 1799**
Michael L. Foreman, Edward R. Franko, and
Geoffrey A. Funk
- 155 Colonic Intussusception and Volvulus 1807**
Katerina Wells
- 156 Colonic Bleeding and Ischemia 1814**
Jennifer A. Leinicke, Eric T. Choi, and Steven R. Hunt
- 157 Diverticular Disease Management 1826**
Rocco Ricciardi, Susannah Clark, and Patricia L. Roberts
- 158 Hemorrhoids and Rectoceles 1848**
Skandan Shanmugan, Bradley J. Champagne, and
Anthony Senagore
- 159 Fissure-in-Ano 1864**
Rahila Essani and Harry T. Papaconstantinou
- 160 Anal Fistula Management 1871**
Piyush Aggarwal, Charles A. Terner, and
Alan G. Thorson

PART THREE

Inflammatory Diseases

- 161 Concepts in Inflammatory Bowel Disease
Management 1888**
Evangelos Messaris and Themistocles Dassopoulos
- 162 Operative Therapy for Ulcerative Colitis:
A Minimally Invasive Approach 1919**
Katerina Wells, Scott A. Strong, and Matthew Mutch
- 163 Surgery for Crohn Disease: Personalizing
the Operation 1941**
Amy L. Lightner, Heidi Chua, and John H. Pemberton
- 164 Appendix 1951**
Geoffrey Fasen, Bruce Schirmer, and Traci L. Hedrick

PART FOUR

Neoplastic Disease

- 165 Inherited Colorectal Cancer and the Genetics
of Colorectal Cancer 1959**
Matthew F. Kalady, C. Richard Boland, and
James M. Church
- 166 Basic Principles of the Operative Treatment of
Colorectal Cancer 1981**
Martin R. Weiser and Julio Garcia-Aguilar
- 167A Transanal Approaches to Early Rectal
Cancers: Transanal Minimally Invasive
Surgery 1992**
Matthew R. Albert, Joseph M. Plummer, and
Lawrence L. Lee
- 167B Transanal Approaches to Early Rectal Cancer:
Transanal Endoscopic Microsurgery and
Conventional Transanal Excision 1997**
Marco E. Allaix and Alessandro Fichera

168 Operations for Rectal Cancer: Low Anterior Resection—Open, Laparoscopic or Robotic, taTME, Coloanal Anastomosis 2005

Anthony P. D'Andrea, Marta Jiménez-Toscano,
Ana Otero-Piñeiro, Raquel Bravo-Infante,
Antonio M. Lacy, and Patricia Sylla

169 Abdominoperineal Resection for Rectal Cancer 2035

Jason Bingham, Matthew Dyer, and Scott R. Steele

170 Minimally Invasive Approaches to Colon Cancer 2049

Jennifer L. Paruch and Todd D. Francone

171 Recurrent and Metastatic Colorectal Cancer 2059

Kellie L. Mathis

172 Management of Metastatic Colorectal Cancer to the Liver 2074

Keith M. Cavaness and William C. Chapman

173 Neoplasms of the Anus: High-Grade Squamous Intraepithelial Lesions and Cancer 2093

Mark Lane Welton and Imran Hassan

174 Retrorectal Tumors 2103

Amit Merchea and Eric J. Dozois

175 Rare Colorectal Malignancies 2117

Scott R. Steele, Yuxiang Wen, and Gregory D. Kennedy

176 Adjuvant and Neoadjuvant Therapy for Colorectal Cancer: Molecular-Based Therapy 2126

Yvonne Coyle

PART FIVE

Techniques and Pearls

177 Prevention, Diagnosis, and Management of Anastomotic Leak 2137

Walter R. Peters Jr., Nathan Smallwood, and
Neil H. Hyman

178 Ostomy Construction and Management: Personalizing the Stoma for the Patient 2147

David E. Beck

179 Reducing the Risk of Infection in the Elective and Emergent Colectomy Patient 2163

Emmanouil P. Pappou and Ravi P. Kiran

180 Reoperative Pelvic Surgery 2172

David W. Dietz and Feza H. Remzi

181 Evidence-Based Decision Making in Colon and Rectal Surgery 2185

Najia N. Mahmoud and Emily Carter Paulson

Index I-1