Management of Bladder Cancer

Badrinath R. Konety • Sam S. Chang Editors

Management of Bladder Cancer

A Comprehensive Text With Clinical Scenarios



Editors
Badrinath R. Konety
Department of Urology
University of Minnesota
Minneapolis, MN, USA

Sam S. Chang Department of Urologic Surgery Vanderbilt University Medical Center Nashville, TN, USA

ISBN 978-1-4939-1880-5 ISBN 978-1-4939-1881-2 (eBook) DOI 10.1007/978-1-4939-1881-2 Springer New York Heidelberg Dordrecht London

Library of Congress Control Number: 2014954231

© Springer Science+Business Media New York 2015

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, 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. While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

For my parents, my wife, and my children none of whom I can ever thank enough.

Badrinath R. Konety

For my parents and family who provide unbelievable understanding, never-ending support, and most importantly, undying love.

Sam S. Chang

Preface

The clinical scope of bladder cancer is well known. As the second most frequent genitourinary malignancy, it is the most expensive cancer to care for from diagnosis to death. Significant improvements in diagnosis and management of this disease provide hope but need to permeate the clinical practice. This textbook provides a single, comprehensive reference source that incorporates all the latest information regarding bladder cancer and will serve as an easy and complete guide for researchers, clinicians, individuals in training, allied health professionals, and medical students. It includes a thorough discussion of all aspects and of all types of bladder cancer. The text covers topics ranging from epidemiology, natural history, diagnosis, risk-stratified management to the latest findings regarding genetics and molecular biology of bladder cancer. Diagnostic and staging evaluation of both non-muscle invasive and invasive bladder cancer are discussed. Guideline-based approaches are analyzed and summarized. Controversies in management of high-grade minimally invasive bladder cancer as well as muscle invasive disease are identified and explained. The application of chemotherapy and multimodality therapy for muscle invasive and advanced disease is outlined and highlighted. Finally gaps in current knowledge and areas for future research are discussed.

The unique feature of this book is the incorporation of clinical scenario-based examples which are discussed by experts in the field who outline their management approach. This would be particularly helpful to practicing physician seeking help in managing controversial aspects of bladder cancer which are fairly commonplace. Several key educational concepts have been incorporated in the framework of patient situations and these chapters are interspersed amidst chapters that provide more complete discussion of subject areas. It is our sincere hope that this book will become a "go to" reference source for all individuals with an interest in the management of bladder cancer.

Minneapolis, MN, USA Nashville, TN, USA Badrinath R. Konety Sam S. Chang

Acknowledgments

We would like to thank Amy Nelson and Mariah Gumpert for their administrative and editorial assistance in putting this book together.

Contents

Part I General Concepts

1	Epidemiology and Natural History	3
2	Screening for Bladder Cancer	17
3	Pathology and Staging: Histopathology and Cytopathology	31
4	Pathology and Staging: Genetics and Molecular Biology Sean McAdams and Michael C. Risk	45
5	Imaging in Localized and Advanced Bladder Cancer	59
6	New Imaging Techniques in the Staging of Urothelial Carcinoma of the Bladder	73
7	Socioeconomic Issues and Improved Quality of Care	85
8	Quality of Life Measures	95
9	Prognostication and Risk Assessment	111
10	Clinical Trials and Emerging Therapeutic Strategies in Bladder Cancer Richard M. Bambury, Robert B. Sims, and Jonathan E. Rosenberg	145

xii Contents

Par	t II Non Muscle Invasive Bladder Cancer	
11	Improved Diagnostic Techniques	155
12	Clinical Scenario: Microscopic Hematuria and Atypical Cytology	171
13	Localized Surgical Therapy and Surveillance	179
14	Clinical Scenario: Initial High-Grade Ta Tumor	191
15	Clinical Scenario: Recurrent Ta Tumor	201
16	Clinical Scenario: Rapidly Growing, High Volume, Low-Grade Ta Tumor	209
17	Clinical Scenario: Low-Grade T1 Tumor	215
18	Intravesical Therapy Jennifer J. Ahn and James M. McKiernan	223
19	Clinical Scenario: Initial CIS	239
20	Management of BCG Recurrent Bladder Cancer Tracy M. Downs, Daniel J. Lee, and Douglas S. Scherr	245
21	Clinical Scenario: Persistent CIS and High-Grade Ta Bladder Cancer After BCG Maurizio Brausi	265
22	Clinical Scenario: Management of Side Effects from Bacillus Calmette-Guérin Bladder Instillation Donald L. Lamm and Nilay M. Gandhi	271
23	Guideline-Based Management of Non-muscle Invasive Bladder Cancer: Comparison of the AUA, EAU, ICUD, and NCCN Guidelines Jeffrey C. Bassett, John D. Seigne, and Peter E. Clark	277
Par	t III Muscle Invasive Bladder Cancer	
24	Open Radical Cystectomy	293

25	Robotic Cystectomy	309
26	Clinical Scenario: T2 Bladder Tumor	327
27	Urinary Diversion: Open and Robotic Techniques Norm D. Smith, Gary D. Steinberg, and Cheryl T. Lee	337
28	Chemoradiotherapy	361
29	Clinical Scenario: Bladder Preservation	379
30	Management of Bladder Cancer, Role of Chemotherapy and Controversies Surrounding Its Application	387
31	Clinical Scenario: Large Volume, Non-metastatic T2 Bladder Tumor Chad R. Ritch and Michael S. Cookson	405
32	The Role of Pelvic Lymphadenectomy at the Time of Radical Cystectomy for Bladder Cancer Samuel D. Kaffenberger, Todd M. Morgan, and Anne K. Schuckman	411
33	Clinical Scenario: Unexpected Positive Nodes at Radical Cystectomy	423
34	Surveillance and Monitoring Daniel J. Canter, Joseph Zabell, Stephen A. Boorjian, and Christopher J. Weight	429
35	Clinical Scenario: The Role of Perioperative Chemotherapy Eila C. Skinner	441
36	Clinical Scenario: Clinical Pelvic Nodal Metastases After Complete Response to Chemotherapy	449
37	Guideline-Based Management of Muscle-Invasive Bladder Cancer: NCCN, ICUD, and EAU Amanda N. Calhoun and Kamal S. Pohar	457
Ind	ex	465

Contributors

Zeeshan Ahmad, M.D. Division of Hematology, Oncology and Transplantation, Department of Medicine, University of Minnesota, Minneapolis, MN, USA

Department of Internal Medicine, Unity Hospital, Fridley, MN, USA

Division of Hematology, Oncology and Transplantation, Department of Medicine, University of Minnesota, Minneapolis, MN, USA

Jennifer J. Ahn, M.D. Department of Urology, New York-Presbyterian Hospital, Columbia University, New York, NY, USA

Department of Urology, Columbia University Medical Center, Herbert Irving Pavilion, New York, NY, USA

Christopher B. Anderson, M.D. Department of Surgery, Urology Service, Memorial Sloan Kettering Cancer Center, New York, NY, USA

Richard M. Bambury, M.B., M.R.C.P.I. Department of Genitourinary Medical Oncology, Sidney Kimmel Center for Prostate and Urologic Cancers, Memorial Sloan Kettering Cancer Center/Weill Cornell Medical College, New York, NY, USA

Daniel A. Barocas, M.D., M.P.H. Department of Urologic Surgery, Center for Surgical Quality and Outcomes Research, Vanderbilt University Medical Center, Nashville, TN, USA

Jeffrey C. Bassett, M.D., M.P.H. Department of Urology, Kaiser Permanente Southern California, , Anaheim, CA, USA

Stephen W. Bickler, M.D., D.T.M. &. H., F.A.C.S. Rady Children's Hospital, University of California San Diego, San Diego, CA, USA

Bernard H. Bochner, M.D., F.A.C.S. Department of Urology, Memorial Sloan-Kettering Cancer Center, Kimmel Center for Prostate and Urologic Tumors, New York, NY, USA

Stephen A. Boorjian, M.D. Mayo Clinic, Rochester, MN, USA

Maurizio Brausi Department of Urology Ausl Modena, B. Ramazzini Hospital, Carpi-Modena, Italy

Amanda N. Calhoun, M.S. Department of Urology, Ohio State University Wexner Medical Center, Columbus, OH, USA

X۷

xvi Contributors

Daniel J. Canter, M.D. Urologic Institute of Southeastern Pennsylvania, Einstein Healthcare Network, Philadelpia, PA, USA

Jorge Raul Caso, M.D., M.P.H. Department of Urology, University of Miami, Bar Harbour, FL, USA

Erik P. Castle, M.D., F.A.C.S. Department of Urology, Mayo Clinic Arizona, Phoenix, AZ, USA

Albert J. Chang, M.D., Ph.D. Department of Radiation Oncology, Helen Diller Family Comprehensive Cancer Center, University of California, San Francisco, CA, USA

Peter E. Clark, M.D. Vanderbilt University Medical Center, Nashville, TN, USA

Michael S. Cookson, M.D., M.M.H.C. University of Oklahoma Medical Center, Oklahoma City, TN, USA

Colin P. Dinney, M.D. Department of Urology, MD Anderson Cancer Center, The University of Texas, Houston, TX, USA

Jose L. Dominguez-Escrig, L.M.S., M.D., F.R.C.S. (Urol) Servicio de Urología, Fundacion Instituto Valenciano de Oncologia, C. Profesor Beltrán Báguena, Valencia, Spain

Tracy M. Downs, M.D. Department of Urology, University of Wisconsin School of Medicine and Public Health, Madison, WI, USA

Nilay M. Gandhi, M.D. James Buchanan Brady Urological Institute, Johns Hopkins Medical Institutions, Baltimore, MD, USA

Maurice Marcel Garcia, M.D., M.A.S. Department of Urology, (Moffit-Long, Mount Zion), San Francisco General Hospital and The San Francisco Veteran's Adminstration Hospital, University of California San Francisco, San Francisco, CA, USA

Joseph A. Gillespie, M.D. Department of Urology, University of Iowa, Iowa City, IA, USA

Alvin C. Goh, M.D. Department of Urology, Houston Methodist Hospital, Houston, TX, USA

Christopher S. Gomez, M.D. Department of Urology, University of Miami Miller School of Medicine, Miami, FL, USA

Mark L. Gonzalgo, M.D., Ph.D. Department of Urology, University of Miami Miller School of Medicine, Miami, FL, USA

John L. Gore, M.D., M.S., F.A.C.S Department of Urology, University of Washington, Seattle, WA, USA

Fred Hutchinson Cancer Research Center, Seattle, WA, USA

Joshua G. Griffin, M.D. Department of Urology, University of Kansas Medical Center, Kansas City, KS, USA

Donna E. Hansel, M.D., M.S.H.S. Department of Pathology, University of California at San Diego, La Jolla, CA, USA

Farnaz Hasteh, M.D. Department of Pathology, University of California at San Diego, La Jolla, CA, USA

Richard E. Hautmann, M.D., M.D. hon. University of Ulm, Neu-Ulm, Germany

Jeffrey M. Holzbeierlein, M.D. University of Kansas Hospital, Kansas City, KS, USA

Gautam Jha, M.B.B.S., M.S. Division of Hematology, Oncology and Transplantation, Department of Medicine, University of Minnesota, Minneapolis, MN, USA

Merce Jorda, M.D., Ph.D., M.B.A. Department of Pathology, University of Miami Miller School of Medicine, Miami, FL, USA

Samuel D. Kaffenberger, M.D. Department of Urologic Surgery, Vanderbilt University, Medical Center North, Nashville, TN, USA

Thomas E. Keane, M.B., Ch.B., F.R.C.S.I., F.A.C.S. Department of Urology, Medical University of South Carolina, Charleston, SC, USA

Adam S. Kibel, M.D. Division of Urology, Department of Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

Timothy Kim, M.D. Department of Genitourinary Oncology, Moffitt Cancer Center, Tampa, FL, USA

Luis A. Kluth, M.D. Department of Urology, New York Presbyterian Hospital, Weill Cornell Medical College, New York, Germany

Department of Urology, University Medical-Center Hamburg-Eppendorf, Hamburg, Germany

Ramdev Konijeti, M.D. Division of Urology, Department of Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

Laura-Maria Krabbe, M.D. Department of Urology, University of Texas Southwestern Medical Center, Dallas, TX, USA

Department of Urology, University of Muenster Medical Center, Muenster, NRW, Germany

Donald L. Lamm, M.D. BCG Oncology, University of Arizona, Phoenix, AZ, USA

Cheryl T. Lee, M.D. Department of Urology, University of Michigan, Ann Arbor, MI, USA

Daniel J. Lee, M.D. James Buchanan Brady Department of Urology, Weill Cornell Medical College, New York Presbyterian Hospital, New York, NY, USA

xviii Contributors

J. Joy Lee, M.D. Department of Urology, Stanford University School of Medicine, Stanford, CA, USA

Seth P. Lerner, M.D. Scott Department of Urology, Beth and Dave Swalm chair in Urologic Oncology, Multidisciplinary Bladder Cancer Program, Baylor College of Medicine, Houston, TX, USA

Yair Lotan, M.D. Department of Urology, University of Texas Southwestern Medical Center, Dallas, TX, USA

Amber Mackey, D.O. Department of Pathology, University of California at San Diego, La Jolla, CA, USA

Sean McAdams, M.D. Department of Urology, University of Minnesota, Minneapolis, MN, USA

James M. McKiernan, M.D. Department of Urology, Columbia University Medical Center, Herbert Irving Pavilion, New York, NY, USA

Edward Messing, M.D. Department of Urology, University of Rochester Medical Center, Rochester, NY, USA

Todd M. Morgan, M.D. Department of Urology, University of Michigan, Ann Arbor, MI, USA

Eduardo Solsona Narbón Servicio de Urología, Fundacion Instituto Valenciano de Oncologia, C. Profesor Beltrán Báguena, Valencia, Spain

Michael A. O'Donnell, M.D. Department of Urology, University of Iowa, Iowa City, IA, USA

Dipen J. Parekh, M.D. Department of Urology, University of Miami Miller School of Medicine, Miami, FL, USA

Manish I. Patel, M.B.B.S., Ph.D., F.R.A.C.S. Westmead Hospital, University of Sydney, Westmead, NSW, Australia

David F. Penson, M.D., M.P.H. Department of Urologic Surgery, Center for Surgical Quality and Outcomes Research, Vanderbilt University Medical Center, Nashville, TN, USA

Kamal S. Pohar, M.D., F.R.C.S.C. Department of Urology, Ohio State University Wexner Medical Center, Columbus, OH, USA

Sima P. Porten, M.D., M.P.H. Department of Urology, MD Anderson Cancer Center, The University of Texas, Houston, TX, USA

Raj S. Pruthi, M.D. Department of Urology, Chapel Hill, NC, USA UNC School of Medicine at Chapel Hill, Chapel Hill, NC, USA

Adam C. Reese, M.D. Assistant Professor, Department of Urology, Temple University School of Medicine, Philadelphia, PA, USA

Michael C. Risk, M.D., Ph.D. Department of Urology, University of Minnesota, Minneapolis, MN, USA

Department of Urology, Minneapolis VA Medical Center, Minneapolis, MN, USA

Chad R. Ritch, M.D., M.B.A. University of Miami, Miller School of Medicine, Miami, FL, USA

Mack Roach III, M.D. Department of Radiation Oncology, Helen Diller Family Comprehensive Cancer Center, University of California, San Francisco, CA, USA

Claus Rödel, M.D. Department of Radiotherapy and Oncology, University Hospital, Goethe University, Frankfurt am Main, Germany

Claudia P. Rojas, M.D. Department of Pathology, University of Miami Miller School of Medicine, Miami, FL, USA

Jonathan E. Rosenberg, M.D. Department of Genitourinary Medical Oncology, Sidney Kimmel Center for Prostate and Urologic Cancers, Memorial Sloan Kettering Cancer Center/Weill Cornell Medical College, New York, NY, USA

James S. Rosoff, M.D. Department of Urology, Yale School of Medicine, New Haven, CT, USA

Douglas S. Scherr, M.D. James Buchanan Brady Department of Urology, Weill Cornell Medical College, New York Presbyterian Hospita, New York, NY, USA

Florine W.M. Schlatmann, M.D. Department of Urology, Radboud University Nijmegen Medical Center, Nijmegen, The Netherlands

Mark Schoenberg, M.D. The Department of Urology, Albert Einstein College of Medicine and The Montefiore Medical Center, Bronx, NY, USA

Anne K. Schuckman, M.D. USC Institute of Urology, Keck Medical Center of the University of Southern California, Los Angeles, CA, USA

Emil Scosyrev, Ph.D. Department of Urology, University of Rochester Medical Center, Rochester, NY, USA

John D. Seigne, M.B. Division of Urology, Dartmouth-Hitchcock Medical Center, Lebanon, NH, USA

Wade J. Sexton, M.D. Department of Genitourinary Oncology, Moffitt Cancer Center, Tampa, FL, USA

Shahrokh F. Shariat, M.D. Department of Urology, New York Presbyterian Hospital, Weill Medical College of Cornell University, New York, NY, USA Division of Medical Oncology, New York Presbyterian Hospital, Weill Cornell Medical College, New York, NY, USA

Professor of Urology, Department of Urology, Medical University of Vienna, New York, NY, USA

Robert B. Sims, M.D. Department of Genitourinary Medical Oncology, Sidney Kimmel Center for Prostate and Urologic Cancers, Memorial Sloan Kettering Cancer Center/Weill Cornell Medical College, New York, NY, USA

xx Contributors

Eila C. Skinner, M.D. Department of Urology, Thomas A. Stamey Research Chair of Urology, Stanford, CA, USA0

Norm D. Smith, M.D. Surgery/Urology, University of Chicago, Chicago, IL, USA

Mark S. Soloway, M.D. Department of Urology, University of Miami Miller School of Medicine, Miami, FL, USA

Guru Sonpavde, M.D. Department of Hematology/Oncology, University of Birmingham Alabama, Birmingham, AL, USA

Division of Hematology and Oncology, University of Alabama, Birmingham, AL, USA

Gary D. Steinberg, M.D., F.A.C.S. Section of Urology, Department of Surgery, The University of Chicago Medicine, Chicago, IL, USA

Robert S. Svatek, M.D., M.S.C.I. Department of Urology, University of Texas Health Science Center San Antonio, San Antonio, TX, USA

Paul D. Sved, M.B.B.S., M.S., F.R.A.C.S. Royal Prince Alfred Hospital, University of Sydney, Newtown, NSW, Australia

Christian Thomas Department of Urology, University Medical Center, Johannes Gutenberg University Mainz, Mainz, Germany

Joachim W. Thüroff, M.D. Department of Urology, University Medical Center, Johannes Gutenberg University Mainz, Mainz, Germany

Christopher J. Weight, M.D., M.S. Department of Urology, University of Minnesota, Minneapolis, MN, USA

Christian Weiss, M.D. Department of Radiotherapy and Oncology, University Hospital, Goethe University, Frankfurt, Germany

J. Alfred Witjes, M.D., Ph.D. Department of Urology, Radboud University Nijmegen Medical Center, Nijmegen, The Netherlands

Michael Woods, M.D. Department of Urology, The University of North Carolina Chapel Hill, Chapel Hill, NC, USA

Joseph Zabell, M.D. Department of Urology, University of Minnesota, Minneapolis, MN, USA