

Frederick L. Greene Andrzej L. Komorowski *Editors*

Clinical Approach to Well-differentiated Thyroid Cancers





Head and Neck Cancer Clinics

Series editors

Rehan Kazi Head and Neck Cancer Manipal University Manipal, India

Raghav C. Dwivedi Head and Neck Cancer Royal Marsden Hospital London, United Kingdom

Head and Neck Cancer (HNC) is a major challenge to public health. Its management involves a multidisciplinary team approach, which varies depending on the subtle differences in the location of the tumour, stage and biology of disease and availability of resources. In the wake of rapidly evolving diagnostic technologies and management techniques, and advances in basic sciences related to HNC, it is important for both clinicians and basic scientists to be up-to-date in their knowledge of new diagnostic and management protocols. This series aims to cover the entire range of HNC-related issues through independent volumes on specific topics. Each volume focuses on a single topic relevant to the current practice of HNC, and contains comprehensive chapters written by experts in the field. The reviews in each volume provide vast information on key clinical advances and novel approaches to enable a better understanding of relevant aspects of HNC. Individual volumes present different perspectives and have the potential to serve as stand-alone reference guides. We believe these volumes will prove useful to the practice of head and neck surgery and oncology, and medical students, residents, clinicians and general practitioners seeking to develop their knowledge of HNC will benefit from them.

More information about this series at http://www.springer.com/series/13779

Frederick L. Greene • Andrzej L. Komorowski Editors

Clinical Approach to Well-differentiated Thyroid Cancers





Editors
Frederick L. Greene
General Surgery
Carolinas Medical Center
Charlotte
North Carolina
USA

Andrzej L. Komorowski General Surgery Hospital Virgen del Camino Sanlúcar de Barrameda Spain

ISSN 2364-4060 ISSN 2364-4079 (electronic) Head and Neck Cancer Clinics ISBN 978-81-322-2567-6 ISBN 978-81-322-2568-3 (eBook) DOI 10.1007/978-81-322-2568-3

Library of Congress Control Number: 2015953342

Springer New Delhi Heidelberg New York Dordrecht London © The Editor(s) (if applicable) and The Author(s) 2012

This edition is jointly relaunched by Springer India and Byword Books Private Limited

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.

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.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Cover illustration by Dan Gibbons DCR(R), PgCert(CT)

Printed on acid-free paper

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

Dedicated to the memory of my grandfathers

Władysław Roman Bochenek, engineer, prisoner of the Gross Rosen and Mittelbau-Dora German Concentration Camps, who taught me the love for the unspoiled nature

and

Adam Ignacy Komorowski, master in goldsmithery, soldier of the Polish First Army, who taught me the meaning of the word Katyń

ALK

Preface

'Disease is very old and nothing about it has changed. It is we who change as we understand what was formerly imperceptible.'

—Jean Martin Charcot (1825–1893)

Differentiated thyroid cancer belongs to the small group of human malignancies with very good prognosis. Excellent outcomes result from the unique tumour biology and constantly improving treatment options. This book has been constructed as a concise clinical guide to the current management of this tumour.

The authors come from nine countries and four continents. The wide geographical distribution and different clinical background of each author result in a unique perspective on a clinical problem. As a rule, the commentaries are written by specialists based in a country other than the country of the author of the chapter.

Some topics are covered by more than one chapter; this is because we believe that each part of this book should be 'functionally' complete to avoid browsing through the pages in search of information that should logically appear also in the chapter the reader is currently reading.

We do hope that this book will help our readers to treat their patients better. We will be more than happy to receive feedback (z5komoro@cyf-kr.edu.pl). This way, the editors can also do better in the future.

Charlotte, NC, USA Sanlúcar de Barrameda, Spain Frederick L. Greene Andrzej L. Komorowski

Abbreviations

AGES Age, grade, extent, size

AJCC American Joint Committee on Cancer

AMES Age, metastasis, extent, size

BSRTC Bethesda System for Reporting Thyroid Cytopathology

CLND Central lymph node dissection

CT Computed tomography

DTC Differentiated thyroid carcinoma

DVT Deep vein thrombosis

EORTC European Organization for Research and Treatment of Cancer

ESPEN European Society for Clinical Nutrition and Metabolism

FAP Familial adenomatous polyposis

FDG 18-Fluoro-2-deoxyglucose

FNA Fine needle aspirate

FNAB Fine-needle aspiration biopsy FNAC Fine-needle aspiration cytology FTC Follicular thyroid carcinoma

GLUT Glucose transporters

IONM Intraoperative nerve monitoring iPTH Intraoperative parathyroid hormone

JCAHO Joint Commission on Accreditation of Healthcare Organizations

MACIS Metastases, age, completeness of resection, invasion, size

MIVAT Minimally invasive video-assisted thyroidectomy

MRI Magnetic resonance imaging

NCCN National Comprehensive Cancer Network

NCDB National Cancer Data Base NCI National Cancer Institute NSCLC Non-small cell lung cancer

PAX8-PARy Peroxisome proliferator-activated receptor-gamma

PEG Percutaneous endoscopic tube
PET-CT Positron emission tomography-CT
PTC Papillary thyroid carcinoma
RET Rearranged during transfection

rhTSH Recombinant human thyroid-stimulating hormone

RLN Recurrent laryngeal nerve

x Abbreviations

SEER Surveillance, Epidemiology, and End Results SPECT Single-photon emission computerized tomography

SSI Surgical site infection
TE Tracheo-oesophageal
Tg Thyroglobulin

TgAb Thyroglobulin antibodies TNM Tumour–node–metastasis

TOVAT Transoral video-assisted thyroidectomy

TSH Thyroid-stimulating hormone

US Ultrasound

WBS Whole-body isotope scan

WDTC Well-differentiated thyroid carcinoma

Contents

1	Historical Perspective and Current Epidemiology	1
2	Pathology of Differentiated Thyroid Cancers	5
3	Clinical Evaluation of the Thyroid Gland	23
4	Imaging in Thyroid Cancer	27
5	Staging of Differentiated Thyroid Cancer	41
6	Preoperative Endocrine Management of Differentiated Thyroid Cancer Barbara Jarząb and Daria Handkiewicz-Junak	45
7	Surgical Treatment of Thyroid Cancer	55
8	Minimally Invasive Approach to the Thyroid	79
9	Management of Advanced Thyroid Cancer: Local Recurrence and Neck Dissections	93
10	Nutritional Issues in Patients with Thyroid Cancer	101
11	Patient Safety in Surgery for Thyroid Cancer	107

12	Postoperative Complications in Thyroid Surgery	115
13	Adjuvant Treatment and Follow Up of Differentiated Thyroid Cancer	125
Ind	ex	145

Contributors

Marcin Barczyński Department of Endocrine Surgery, 3rd Chair of General Surgery, Jagiellonian University, Medical College, Krakow, Poland

Tahar Benhidjeb Department of General, Visceral and Thoracic Surgery, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Carmine De Bartolomeis Department of Surgery, University of Pisa, Ospedale Santa Chiara, Pisa, Italy

Istvan Gal Department of Surgery, Telki International Private Hospital, Telki, Hungary

Frederick L. Greene Department of General Surgery, Carolinas Medical Center, Charlotte, NC, USA

Stephen J. Gwyther Department of Radiology, East Surrey Hospital, Redhill, Surrey, UK

Daria Handkiewicz-Junak Department of Nuclear Medicine and Endocrine Oncology, Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology, Gliwice Branch, Gliwice, Poland

Pietro Iacconi Department of Surgery, University of Pisa, Ospedale Santa Chiara, Pisa, Italy

Barbara Jarząb Department of Nuclear Medicine and Endocrine Oncology, Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology, Gliwice Branch, Gliwice, Poland

R. Kalyani Department of Pathology, Sri Devaraj Urs Medical College, Sri Devaraj Urs Academy of Higher Education and Research, Sri R.L. Jalappa Hospital and Research Centre, Kolar, Karnataka, India

Stanislaw Kłęk Department of General Surgery, 1st Chair of General Surgery, Jagiellonian University Medical College and Nutrimed Medical Corporation, Krakow, Poland

xiv Contributors

Andrzej L. Komorowski Department of General Surgery, Hospital Virgen del Camino, Sanlúcar de Barrameda, Spain

Artur Komorowski Department of Medical Education, Jagiellonian University, Medical College, Krakow, Poland

Department of Radiology, Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology, Krakow, Poland

Markus Luster Department of Nuclear Medicine, University of Ulm, Ulm, Germany

Gabriele Materazzi Department of Surgery, University of Pisa, Pisa, Italy

Ettienne J. Myburgh Department of Surgery, Panorama Medi-Clinic and Head, Neck and Breast Unit, Tygerberg Academic Hospital, Cape Town, South Africa

Josephine N. Rini Department of Nuclear Medicine, Albert Einstein College of Medicine of Yeshiva University, Bronx, NY, USA

North Shore-LIJ Center for Advanced Medicine, New Hyde Park, NY, USA

Mitchell Goldman Diagnostic Imaging Center, Lake Success, New York, USA

Janusz Ryś Department of Tumour Pathology, Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology, Krakow, Poland

Amit Vats Department of Biosurgery and Surgical Technology, Imperial College, St Mary's Hospital, London, UK

Joanna Wysocka Department of Tumour Pathology, Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology, Krakow, Poland

Andrzej M. Wysocki Department of General Surgery, 2nd Chair of General Surgery, Jagiellonian University, Medical College, Krakow, Poland

Wojciech M. Wysocki Department of Surgical Oncology, Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology, Krakow, Poland