
Imaging and Pathology of Pancreatic Neoplasms

Mirko D'Onofrio • Paola Capelli
Paolo Pederzoli
Editors

Imaging and Pathology of Pancreatic Neoplasms

A Pictorial Atlas

Second Edition

 Springer

Editors

Mirko D'Onofrio
Department of Radiology, University
of Verona, GB Rossi University Hospital
Azienda Ospedaliera Universitaria Integrata
Verona
Verona, Italy

Paola Capelli
Department of Pathology, GB Rossi
University Hospital
Azienda Ospedaliera Universitaria Integrata
Verona
Verona, Italy

Paolo Pederzoli
Department of Surgery
Pederzoli Hospital
Peschiera del Garda (VR), Italy

ISBN 978-3-031-09830-7 ISBN 978-3-031-09831-4 (eBook)
<https://doi.org/10.1007/978-3-031-09831-4>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2022
This work is subject to copyright. All rights are solely and exclusively licensed 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, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Professor Carlo Procacci had the idea of an Atlas on the imaging and pathology of pancreatic neoplasms around the year 2000. Carlo Procacci was born in Corato, Puglia, Italy, in 1950 and died in Verona, Veneto, Italy, in 2004. His idea was recovered in 2012 by Paola Capelli, and this book is the result.

Thanks Professor, the teachings last forever.

Mirko D'Onofrio



“Friend, you will forever be in our thoughts as your thoughts will always be part of us.”

Alec J. Megibow

Ipotesi

*Ipotesi di vivere
di essere di divenire
speriamo andiamo
nell'ipotesi di noi stessi
niuna cosa è tesi solo la morte nella sua verità
Rubiamo ogni ora alla speranza
e risorgiamo
nell'ipotesi del nuovo
Anche il seme nella terra
è un'ipotesi
dell'erba e del fiore
Anche il bimbo nella mamma
è un'ipotesi
dell'uomo che sarà
Anche tutti noi che corriamo
gli altri siamo ipotesi
immagini solo negli occhi nei capelli
solo parvenze o mistificazioni
saremo certezze solo in ciò che daremo
È l'amore che fa il fiore
È il sorriso che fa il bambino
È l'attenzione alla apertura del cuore
che fa per noi la sapienza migliore
proiezione sicura per l'eternità*

Maria Antonietta Cocco

(Tra ombra e luce, 2021)

Foreword to the Second Edition

When a book reaches its second edition, it can only be an exceptional book!

This is even more evident when it comes to a text on medical sciences; the widespread dissemination of information via the Web makes the pages of a medical book to leaf through and study more and more (theoretically!) “useless”!

In the first edition foreword, I wrote “... I believe that Mirko D’Onofrio, one of the younger and favorite of Carlo’s apprentices, has brilliantly compiled his teachings in this volume, reflecting how Prof. Procacci was able to share his knowledge with others.”

The success of the book clearly demonstrates that I was perfectly right.

Mirko had promised himself in wanting to make this text a tribute to his master, but it is not just a question of celebrating the memory of Prof. Procacci; this result is also the best way to celebrate the “Verona Pancreas Institute” method and approach to the patient: relationship with other disciplines and mutual interaction between different disciplines!

I am convinced that this is the real secret of this text: by reading it, you let yourself be transported from mere descriptive radiology to a modern clinical–radiological approach.

Thanks Mirko, and thanks to all your collaborating colleagues once again. Of course, I am ready for more and more “forewords” in the next future!

Verona, Italy

Claudio Bassi

Acknowledgments

The volume editors wish to express their most sincere thanks to the following colleagues, for their invaluable contribution and the precious exchange of constructive clinical and scientific experiences: Alec J. Megibow, Cristina Hajdu, Christoph Dietrich, Enrico Martone, Giancarlo Mansueto, Giovanni Carbognin, Carlo Biasiutti, Rossella Graziani, Alessandro Guarise, Elisabetta Buscarini, Paolo Arcidiacono, Arnaldo Fuini, Marco Ferdeghini, Franco Bonetti, Erminia Manfrin, Alice Parisi, Massimo Pregarz, Luigi Romano, Giuseppe Zamboni.

The volume editors are furthermore grateful to the following collaborators, for their effective technical support: Alma Olivieri, Renato Padovani, Flavio Rigo, Manola Crestani, Nicola Sperandio, Stefano Minutelli.

Contents

Ductal Adenocarcinoma	1
Mirko D’Onofrio, Riccardo De Robertis, Alessandro Beleù, Paolo Tinazzi Martini, Emilio Barbi, Luca Geraci, Luisa Tomaiuolo, Giovanni Morana, and Paola Capelli	
Ductal Adenocarcinoma: Downstaging	99
Riccardo De Robertis, Paola Capelli, Chiara Longo, and Mirko D’Onofrio	
Neuroendocrine Neoplasms	141
Riccardo De Robertis, Mirko D’Onofrio, Paolo Tinazzi Martini, Stefano Gobbo, Maria Gaia Mastrosimini, Lavinia Stefanizzi, Alessandro Beleù, Luca Geraci, Aldo Scarpa, and Paola Capelli	
Mimickers of Pancreatic Tumor	233
Mirko D’Onofrio, Antonio Giugliano, Gregorio Aluffi, Roberto Calbi, Angela Calabrese, and Riccardo De Robertis	
Intraductal Papillary Mucinous Neoplasm (IPMN)	251
Giovanni Morana, Mirko D’Onofrio, Paolo Tinazzi Martini, Riccardo De Robertis, Alessandro Beleù, Claudio Luchini, Eda Bardhi, Nicolò Cardobi, and Paola Capelli	
Serous Neoplasms	327
Paola Capelli, Paolo Tinazzi Martini, Giovanni Morana, Riccardo de Robertis, Claudio Luchini, Stefano Gobbo, and Mirko D’Onofrio	
Mucinous Neoplasms	361
Mirko D’Onofrio, Paola Capelli, Claudio Luchini, Paolo Tinazzi Martini, Emilio Barbi, and Riccardo De Robertis	
Pseudocysts and Other Cystic Lesions	393
Valentina Ciaravino, Roberto Calbi, Antonio Giugliano, Luca Geraci, Luisa Tomaiuolo, Chiara Longo, Riccardo De Robertis, and Mirko D’Onofrio	
Secondary Tumors and Lymphoma	415
Paolo Tinazzi Martini, Eda Bardhi, Antonia Maria Olivieri, Marco Todesco, Daniele Autelitano, Luisa Tomaiuolo, Luca Geraci, and Paola Capelli	
Uncommon Presentations of Pancreatic Neoplasms, Rare Neoplasms, and Peripancreatic Masses	435
Riccardo De Robertis, Antonia Olivieri, Angela Calabrese, Luca Geraci, Nicolò Cardobi, Paolo Tinazzi Martini, Roberto Calbi, Paola Capelli, and Mirko D’Onofrio	

Pancreatic Surgery and Post-Operative Complications	451
Riccardo De Robertis, Luca Geraci, Nicolò Cardobi, Luisa Tomaiuolo, Antonia Maria Olivieri, Francesco Verrengia, Francesco Cicalò, Filippo Moro, Roberto Calbi, and Mirko D’Onofrio	
Imaging Methods for Pancreatic Neoplasms	463
Alessandro Beleù, Fabrizio Urraro, Roberto Calbi, Chiara Longo, Annalisa Cominzioli, Riccardo De Robertis, Nicolò Cardobi, and Mirko D’Onofrio	
Advanced Imaging of Pancreatic Neoplasms	481
Nicolò Cardobi, Riccardo De Robertis, and Mirko D’Onofrio	
Elastography and New Ultrasound Techniques	495
Christoph F. Dietrich, Adrian Saftiou, Michael Hocke, and Liliana Chiorean	
Percutaneous Interventional Procedures in Pancreatic Cancer	517
Mirko D’Onofrio, Antonia Maria Olivieri, Francesco Verrengia, Filippo Moro, Luca Geraci, Luisa Tomaiuolo, Chiara Longo, Francesco Cicalò, Cesare Cacciatore, Alice Parisi, Erminia Manfrin, and Riccardo De Robertis	
New Diagnostic and Interventional Endoscopic Techniques	535
Michael Hocke	