A.M.K. Thomas, A.K. Banerjee, U. Busch

Classic Papers in Modern Diagnostic Radiology

Adrian M.K. Thomas
Arpan K. Banerjee
Uwe Busch
EDITORS

Classic Papers in Modern Diagnostic Radiology

Foreword by Willi A. Kalender, Erlangen

Springer

Dr. Adrian M.K. Thomas
Consultant Radiologist
Royal Princess Hospital Dept. of Nuclear Medicine
Orpington, Kent BR6 8ND, UK

Dr. Arpan K. Banerjee, MBBS, FRCP, FRCR
Consultant Radiologist
Birmingham Heartlands and
Solihull Hospitals NHS Trust
Birmingham B9 5SS, UK

Dr. Uwe Busch
Medical Physicist
Deutsches Röntgen-Museum
Schwelmer Straße 41
42897 Remscheid, Germany

ISBN 3-540-21927-7 Springer Berlin Heidelberg New York

Library of Congress Controll Number: 2004110773

Springer is a part of Springer Science+Business Media
springeronline.com

Printed in Germany

Editor: Dr. U. Heilmann, Heidelberg, Germany
Desk editor: W. McHugh, Heidelberg, Germany
Production: PRO EDIT GmbH, Heidelberg, Germany
Cover-Design: Frido Stein-Broo, Pau, Spain
Typesetting and Reproduction: AM-productions GmbH, Wiesloch, Germany

Printed on acid-free paper 21/3150Di - 5 4 3 2 1 0

Dedications

For my father Professor P. K. Thomas
Adrian M.K. Thomas

For my daughters Shonali and Shiuli
Arpan K. Banerjee

For my family Ulrike, Bjoern, Florian and Alina
Uwe Busch

Foreword

I am very pleased to have been asked to write the foreword to this book. The technical advances in diagnostic radiology in the last few decades have transformed clinical practice and have been nothing short of astonishing.

The subject of diagnostic radiology is now very large and radiology departments are involved in all areas of modern patient care. The defining event in modern radiology, and arguably the most significant development in radiology since Wilhelm Röntgen discovered X-rays, was the invention of the CT scanner in the 1970s. The CT scanner introduced modern cross-sectional imaging and also digital imaging. We now have MRI and ultrasound and these techniques are replacing many traditional X-ray procedures. The developments in radiology have been the result of a fruitful interaction between the basic sciences, clinical medicine and the manufacturers. This can be seen by looking at the various sources of these publications. Change is produced by the interactions between the various disciplines.

The editors have had a very difficult task in selecting the key discoveries and descriptions. The radiological literature is very large. Medical imaging continues to develop rapidly and these papers are the foundations of our current practice.

Prof. Dr. Willi A. Kalender
Institute of Medical Physics
Friedrich-Alexander-University, Erlangen-Nürnberg

Preface

In the past few decades the practice of diagnostic radiology has been transformed almost beyond recognition. In traditional radiological practice, diagnostic techniques often showed the pathology indirectly; for example, the presence of a pancreatic pseudocyst could be inferred by the displacement of a barium-filled stomach. Diagnostic tests were often invasive and these would then be followed by conventional surgery. We are now moving to a position where diagnosis is made by a non-invasive imaging procedure and treatment is by minimally invasive surgery. Performing angiography for placental localization and even the traditional oral cholecystogram are now only memories. The patient who needs surgery will have had appropriate imaging so the surgeon can plan the most effective course of action and may also suggest that surgery is not the most appropriate course of action.

It is always interesting to read about the great names who have by their discoveries advanced the practice of clinical medicine. There have been a number of books which have given the original descriptions of the writers, such as the "Classic Descriptions of Disease" by Ralph Major and the "Source Book of Medical History" compiled by Logan Glendenning. The sources of both of these books reach back into antiquity. The history of radiology is considerably younger and is a little more than 100 years old, having started with the discovery of X-rays by Wilhelm Röntgen in 1895. André Bruwer did the radiological community a great service when in 1964 he produced his two volumes of "Classic Descriptions in Diagnostic Roentgenology". In these two books he reproduced the classic accounts of diagnostic radiology from the earliest days and gave an account of the techniques that were then in use. Radiology has transformed beyond all recognition since 1964. We now have ultrasound, CT, MRI and interventional radiology. The traditional contrast media have been replaced by the modern agents and X-ray film is disappearing and is being replaced by an electronic image. However, radiology remains central to modern patient care.

In this book we provide a selection of classic papers of modern radiology. The choice of papers is obviously personal; however, we feel that the papers chosen have stood the test of time. There are many important papers that have not been included. In this book the papers are reproduced in their original form so that the reader is able to read what was originally said. In the introduction to each section the significance of the paper is discussed with some biographical details where appropriate. Nuclear medicine has not been included.

In general there is a bias towards the more technical papers. However, the articles chosen have resulted in many clinical papers. It is when the papers are brought together that the extent of the achievements of clinical radiology becomes apparent.

Adrian M. K. Thomas
Arpan K. Banerjee
Uwe Busch

Acknowledgements

We would like to thank Ute Heilmann and her colleagues at Springer for their encouragement and support for this project. Furthermore, we would like to thank the following people for their help in providing us with information for our book: Torsten Almén, Robert Brasch, Ruediger Brennecke, Brigitte Bukovics, Lawrence Cheung, Jim Culley, Lars Edler, Dave Fellers, Leila Gray, Brian Lentle, Shannon Hamilton, Paul Heintzen, Kazuhiro Hishinima, Hans-Joachim Holländer, Stephen Horii, The late Sir Godfrey Hounsfield, Bernie Huang, Lothar Jeromin, Willi Kalender, Stuart S Kaplan, Hisatoyo Kato, Gerald M. Kolodny, Robert A. Kruger, Paul Lauterbur, José Leborgne, Denny Lee, Heinz U. Lemke, Betty Levine, Sir Peter Mansfield, Charles A. Mistretta, Peter R. Mueller, Sol Nudelman, John A. Parker, Stephen H. Parker, Jean Pringot, John Reid, The late Neil Ridyard, Stephen J. Riederer, John Rowlands, Ulrich Sigwart, Ralph Smathers, Eric vanSonnenberg, László K. Tabár, René van Tiggelen, Peter Vock, Hans-Joachim Weinmann, Nellie Wild, Joseph Woo, and Wei Zhao.

Our special thanks for granting us permission to use the original papers free of charge are extended to:
American Association of Physicists in Medicine
American Physical Society
American Roentgen Ray Society
British Institute of Radiology
Computers in Cardiology
Lippincott Williams & Wilkins
Massachusetts Medical Society
MMW Fortschritte der Medizin
M Pacquet JBR-BTR
Radiological Society of North America
Royal College of Obstetricians and Gynaecologists
Saxon Academy of Science
Sociedad de Cirugia del Uruguay
Taylor & Francis Group
Walter De Gruyter

Contents

4 Digital Imaging

5 PACS

6 Contrast Agents

7 Angiography and Interventional Radiology

Authors Index