

Giuseppe Guglielmi · Wilfred C.G. Peh · Mario Cammisa

High-Resolution Radiographs of the Hand

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High-Resolution Radiographs of the Hand

With 213 Figures

 Springer

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This book is dedicated to our families.

Their continuous love, support, and inspiration to us are much appreciated.

Foreword I

Plain radiography is still alive. In many institutions, including ours, conventional radiography has been replaced by digital systems including imaging-plate-based computed radiography and flat-panel detector-based digital radiography. Even for the education of radiation technologists, conventional film-screen radiography has been de-emphasized, and their education is concentrated on digital systems.

Spatial resolution of a conventional system is still far better than the current digital systems, although the dynamic range is wider in the latter system. Industrial film radiography with small grain size and direct exposure has an even higher resolution, and such high-resolution systems are something we lost in the transition from the conventional system to the current PACS-friendly system.

I am pleased to know that Giuseppe Guglielmi and Wilfred Peh have published this textbook of high-resolution hand radiographs that cannot be obtained with any other techniques. Radiography has always been the most important modality in the evaluation of the hand, and, moreover, high-resolution industrial films are extremely effective in the evaluation of the hand, particularly for assessing subtle erosions.

Hands are not just one of the peripheries of the human body. They reflect conditions of the whole human body. Not only the metabolic status, but also many congenital disorders are manifested in the hand. Radiographic findings of the hand are often specific, and contribute to the diagnoses a great deal. There have been several publications concerning the radiology of the hand, and they have been well accepted.

I congratulate Giuseppe Guglielmi, Wilfred Peh and Mario Cammisa for accomplishing this important task. I hope this work is accepted widely by those who are interested in musculoskeletal imaging.

May 2008, Morioka, Japan

Professor Shigeru Ehara, MD
President of the Asian Musculoskeletal Society (AMS)

Foreword II

Imagine the ultimate charts of the most important photographs of humankind! The photograph of the hand of Mrs. Roentgen by means of X-rays will surely be in the “Top 10.”

The discovery of “X-rays” by Conrad Roentgen marked a rarely paralleled breakthrough in the diagnosis of normal and pathologic conditions. The use of X-rays has brought to light numerous new pathologies. This is particularly true for the diagnostic evaluation of the hand, although the thin soft tissue covering of the hand allows relatively easy clinical examination of this anatomic area.

In the last 30 years, diagnostic imaging of the hand has changed dramatically. New modalities such as bone scintigraphy and cross-sectional imaging (CT, MRI, sonography) have evolved. At the same time tremendous progress has been made in therapeutic options, mainly due to microsurgical techniques. We have learned more about the pathophysiology and biomechanics of the wrist. The enthusiasm provoked by this progress may tempt the inexperienced medical community to underestimate the value of X-rays in the diagnosis of numerous conditions in the hand. At such a time a book against the trend is more than necessary.

The authors and the publisher are to be congratulated for presenting at the right time a book of high aesthetic and didactic quality about a seemingly “old-fashioned” topic. It is a sign of deep understanding and knowledge to underline the enormous validity of X-rays in the diagnostic workup of local and systemic disease in the hand. We have to understand that for the majority of pathologic conditions, cross-sectional imaging and scintigraphic techniques complete the technically perfect radiograph of the hand—and not vice versa.

It is to the great merit of Giuseppe Guglielmi, Wilfred Peh and Mario Cammisa that they illustrate the tremendous diagnostic

potential of X-rays at the right time. There is a saying “an image tells more than thousand words.” The authors have followed this principle with great success. They have to be thanked for the investment of time and energy that a project such as this requires.

June 2008, Augsburg, Germany *Professor Klaus Bohndorf, MD*
President of the International Skeletal Society

Foreword III

Despite sophisticated imaging methods developed in the hundred years since the discovery of X-rays, plain radiography is still the primary method of choice in the evaluation of skeletal system diseases. In most systemic diseases, pathologic changes develop in the bone and soft tissues of the hand and wrist, whose images can be taken easily and at low cost. Diseases originating from bone can also cause radiological changes in the hand and wrist. Using the appropriate technique and position in radiological evaluations of pathological conditions involving the hand and wrist is essential for proper diagnosis.

In this atlas, diseases leading to pathological changes in the hand and wrist, normal radiological images taken in different stages of disease and variants are displayed in detail using high-resolution industrial radiographs. The authors demonstrate how it is still important to use analogue technique imaging for fine details in the assessment of small bone structures. The information provided for each example will help the reader remember the images related to each disease, and the atlas will be an important source not only for radiologists but also for rheumatologists, orthopedists, hand surgeons and their residents.

I would like to congratulate Giuseppe Guglielmi, Wilfred Peh and Mario Cammisa, the authors of the book, for their meticulous work. We are grateful for the time and enthusiasm they gave to this effort.

June 2008, Izmir, Turkey

Professor Remide Arkun, MD
President of European Society
of Musculoskeletal Radiology (ESSR)

Preface

The hand, the first human part ever studied with X-rays, may be the primary clue to underlying systemic disease. In many instances, the findings on the radiograph of the hand may be pathognomonic of the disease. As the early stages of a disease usually begin with the involvement of a small area of tissue, the early diagnosis of pathologic conditions by means of radiographs requires the detection of minute changes. The challenge is therefore to produce X-ray images of findings much finer than those observable by the naked eye on conventional radiographs. This requirement is met by using high-resolution industrial radiographs. High-resolution industrial radiographs are able to optimize the maximum amount of information in order to provide the best prognosis and facilitate management. There are conditions which require a higher X-ray dose to provide sufficient details in the image for a successful diagnosis. Mammography, oncology, and orthopedics are examples where there is a delicate balance of dose versus image quality.

This atlas aims to illustrate various systemic as well as localized diseases that manifest themselves on radiographs of the hand and wrist and which need very detailed images in order to arrive at the diagnosis of the disease process. Sometimes, there are limitations in the radiologic diagnosis and, therefore, clinical, laboratory, and additional radiographic examinations are needed. However, satisfactory differential diagnosis can often be arrived at, even with a single radiographic finding, especially if the radiographic image is of excellent quality. This work is meant to be an atlas—not a text book—and therefore the illustrations are large and the written text is kept to a minimum. Each illustration is supplied with a description and, for the convenience of the reader, a supplementary reference list is presented at the end of the book.

July 2008

Giuseppe Guglielmi
Wilfred C. G. Peh
Mario Cammisa

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