Foreword

Sports activity is an important part of our modern lifestyle, among both amateurs and professionals. It makes an important contribution to our sense of well-being in today's society. However, it has its price in terms of orthopedic injuries.

This volume therefore addresses an important issue of everyday life and medicine. Its contents cover the entire imaging field of all orthopedic sports injuries remarkably well and in great detail.

The editors and contributing authors are all renowned experts in musculoskeletal radiology.

I congratulate them on this up-to-date, well-researched and superbly illustrated volume which covers modern radiological imaging of the whole spectrum of orthopedic sports injuries comprehensively and thoroughly.

I am convinced that this book will be a great teaching tool for radiologists in training, as well as for certified radiologists. It will also constitute a highly informative reference book for other medical disciplines.

I sincerely hope that this volume will meet with the same success as the numerous other volumes already published in the series Medical Radiology – Diagnostic Imaging.

Leuven

ALBERT L. BAERT
Imaging of sports related injuries has always been a very popular topic and the interest of radiologists in this domain has even increased in recent years.

Competitive athletes are vulnerable to a variety of injuries and they are often very demanding in their expectations of a correct diagnosis, appropriate treatment and advice on prognosis and estimated recovery period. Working in sports imaging means team effort, whereby sports physicians, physical therapists, orthopaedic surgeons, radiologists and technicians work closely together. Radiology plays a pivotal role in this process.

Since our society is more fitness oriented than ever, a large percentage of the general population is involved in recreational sports activities, and thus prone to injuries. This underscores the impact of sports medicine in our daily practice.

Imaging of sports injuries has evolved dramatically since the introduction of MR imaging, high resolution ultrasound and multi-detector computed tomography.

Indeed, whereas imaging evaluation was almost exclusively done by plain radiography and scintigraphy in the early years, application of new techniques enables the radiologist to make a more precise diagnosis.

Before 1988, the term “bone marrow edema” did not exist in the radiological literature, but since the introduction of MR imaging in musculoskeletal imaging, more than 300 articles have been written on this specific item.

Several recent monographs and review articles on sports imaging concentrated on a single imaging technique, such as ultrasound or MR imaging.

This book aims to provide a comprehensive overview of all imaging techniques used in the evaluation of patients with sports injuries.

Therefore, we summarized the merit of each technique in the diagnostic setting of these injuries in a concise table in each chapter of this book.

We have been very fortunate to work with talented and outstanding experts in the field of musculoskeletal imaging.

Furthermore, we are particularly grateful to Professor Albert L. Baert for giving us the opportunity to edit this work, as well as to our previous mentors Professor Arthur M. De Schepper and the late Dr. Piet F. Dijkstra for teaching us special aspects of musculoskeletal radiology.

We are also deeply indebted to the technicians and co-workers in our respective departments for providing us high quality images.

Last but not least, we want to thank our families for their constant support while we were working on this amazing project.

We hope that this work becomes a valuable resource for those participating in the care of patients who have sustained sports-related injuries.

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Performing sports activities brings with it the possibility of producing alterations in muscle-tendinous structures and joints through trauma or overuse.

Both these pathologies imply that the activities are to be suspended, which often leads to the athlete, who is by definition an active individual, having to accept his/her condition, something which is not always easy to do. Therefore, the athlete and the entire sports environment surrounding him/her expect the problem to be solved in the shortest possible time.

The mandatory clinical examination, even if often able to provide precise information, must also include a diagnostic study which confirms or details the clinical data. This means that diagnostic imaging is a fundamental step in orthopedic sports injuries. It is essential, however, that the imaging technique/s chosen for the trauma be tailored on the basis of the sensitivity and specificity of each individual technique in relation to the type of injury. Moreover, the specialist must be well versed in this particular field of pathology.

Indeed, also on the basis of my personal experience as the radiologist responsible for the diagnostic imaging of various National Italian Teams in several sports (soccer, volley-ball, basket-ball, athletics etc.), as well as for the radiological coverage of the 2006 Winter Olympic Games, I have observed that it is very important on the one hand to establish a good collaborative relationship with the clinician/s, while on the other, and more particularly, to be aware of the limitations and possibilities of each technique.

Although it is not always easy to determine the precise technique capable of demonstrating a lesion, with the aid of patient’s history and clinical experience it is possible to choose the most appropriate imaging modality.

It is often difficult to differentiate the changes induced by the athletic movements (typical for each individual sport), to be considered an asymptomatic para-physiological adaptation, from the lesion itself, which lies at the basis of such alterations.

Consequently, in muscle-tendinous pathology, US and MRI are able to complement one another, as long as they are used correctly on the basis of temporal and topographic parameters. When a lesion is recent and superficial, US is able to offer a correct diagnosis, whilst MRI is more sensitive in the detection of the deeper lesion/s, or when a more panoramic view is required.

When dealing with skeletal lesions, plain radiography is surely the first examination to be performed, complemented with the CT scan for multiplanar codification and MRI for bone marrow alterations.

MRI is often the first examination for joint pathology to establish whether intra-articular alterations are present. In some cases administration of intra-articular contrast medium (MR-arthrography is required).
Imaging in the follow-up phase of sports injuries is also fundamental, so as to monitor the evolution of the lesion/s, both after surgical and/or conservative/re-educational treatment, supplying useful data so as to forecast when the athlete may return to normal sports activities again.

In conclusion, the radiologist responsible for this interesting field of activity, i.e. orthopedic sports injuries, must be able to apply his/her specialist technical knowledge in radiology to the many and varied problems involved in sports injuries, thus identifying not only the most suitable technique to be used, but also, and above all, to try to propose diagnostic protocols for each individual pathology in collaboration with the trauma team specialists. Indeed, the ultimate goal is to make a correct diagnosis, follow the evolution of the lesion and re-integrate the athlete into sports activities in as short a time as possible and in the best possible health.

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