

CONTENTS

- Preface** xi
 Javier Beltran
- Normal MR Imaging Anatomy of the Elbow** 191
 Keir A.B. Fowler and Christine B. Chung
- The functional complexity achieved at the elbow is a reflection of the sophisticated architecture that embodies this articulation. In addition to challenging anatomic relationships to conceptualize, there are many anatomic variations that exist in the osseous, capsular, and muscular structures. This article offers a detailed description of the structural and imaging anatomy of the elbow, information that establishes the foundation of imaging interpretation of internal derangements.
- Normal MR Imaging Anatomy of the Wrist and Hand** 207
 Joseph S. Yu and Paula A. Habib
- MR imaging is widely used in the evaluation of internal derangement of joints. In the past, the use of hand and wrist MR imaging lagged behind imaging of larger joints, largely because of technical limitations of spatial resolution and signal-to-noise ratio when imaging the small anatomic structures. However, with recent technical advances in extremity coil design, MR imaging has provided us with new insights into the difficult anatomy of the wrist by allowing improved visualization of the relationship of the muscles, ligaments, tendons, and bone. Although the limits of spatial resolution afforded by specialized surface coils and signal processing methods may not have yet been completely realized at 1.5 Tesla, the potential for significant improvements in hand and wrist imaging is likely to rest with the advent of higher strength magnets.
- MR Imaging of Ligament Injuries to the Elbow** 221
 Liat J. Kaplan and Hollis G. Potter
- MR imaging is a highly valuable tool in the evaluation of ligamentous injuries of the elbow. Proper coil selection, patient positioning, and pulse sequence parameters are essential for optimization of image quality. Clinical evaluation of ligamentous injuries is often difficult and visualization at surgery may be limited. MR imaging can demonstrate not only ligamentous pathology but abnormalities in the adjacent osseous and soft tissue structures, making it an important aid to clinical management. In skeletally immature

patients, MR imaging can demonstrate injury not only to the ligaments but to the physes and apophyses, making it useful in the evaluation of the pediatric elbow.

MR Imaging of Tendon Abnormalities of the Elbow

Christine B. Chung, Felix S. Chew, and Lynne Steinbach

233

Tendon injuries about the elbow are among the most commonly encountered pathology in this articulation. These injuries are often the result of chronic repetitive microtrauma but can be seen in the setting of acute trauma. This article focuses on the imaging diagnosis of tendon pathology in the elbow and the associated findings that can be seen with tendon injury. A detailed understanding of common pathology and patterns of injury can facilitate the ease and accuracy of imaging diagnosis.

MR Imaging of Entrapment Neuropathies at the Elbow

Marcelo Bordalo-Rodrigues and Zehava Sadka Rosenberg

247

MR imaging has a valuable role in the evaluation of compressive neuropathies at the elbow. Specific MR signs in association with clinical findings can supply an accurate diagnosis. A review of normal anatomy, clinical features, and MR assessment of nerve entrapment syndromes at the elbow is presented.

MR Imaging of Common Entrapment Neuropathies at the Wrist

Marcelo Bordalo-Rodrigues, Parinita Amin, and Zehava Sadka Rosenberg

265

MR imaging is a useful technique in the work-up of compressive neuropathies at the wrist, providing fine anatomical detail and excellent diagnostic accuracy. MR imaging, however, should be reserved for those cases in which the clinical and electrodiagnostic findings are inconclusive, the symptoms are unusually severe, or when a tumor is suspected. This article reviews the normal anatomy and the MR imaging features of the most common compressive neuropathies at the wrist: carpal and ulnar tunnel syndromes.

MR Imaging Findings in Ulnar-Sided Wrist Impaction Syndromes

Luis Cerezal, Francisco del Piñal, and Faustino Abascal

281

Ulnar-sided wrist impaction syndromes are a common source of ulnar pain and limitation of motion. These conditions refer to a group of pathologic entities that result from repetitive or acute forced impaction between the distal ulna and ulnar carpus or distal radius and surrounding soft tissues. MR imaging allows earlier detection of the bone and soft-tissue lesions that are present in the different ulnar-sided wrist impaction syndromes and is helpful in formulating the extensive differential diagnosis in patients with ulnar wrist pain and limitation of motion.

MR Imaging of Ligaments and Triangular Fibrocartilage Complex of the Wrist

Michael B. Zlatkin and Joel Rosner

301

Imaging of the wrist with MR imaging can be difficult because of the small size of this joint, its complex anatomy, and its sometimes poorly understood pathologic lesions. A recent study by Hobby and coworkers of 98 patients revealed that MR imaging of the

wrist influences clinicians' diagnoses and management plans in most patients. This article summarizes the current diagnostic criteria that can be useful in interpreting abnormalities of the wrist ligaments and triangular fibrocartilage complex (TFCC) of the wrist in this difficult topic in joint MR imaging.

MR Imaging of Tendon Lesions of the Hand and Wrist

333

Jenny T. Bencardino

MR imaging of the hand and wrist tendons has greatly benefited from the use of dedicated surface coils, which allow fine depiction of the intricate anatomy of these structures, owing to high spatial resolution images as well as superb soft tissue contrast. MR imaging of the wrist and hand is obtained in the axial, sagittal, and coronal planes. The axial and sagittal planes provide most of the information necessary, however, to assess the tendons at the wrist and hand. The axial images are optimal for evaluating tendon morphology, longitudinal splits, tendon sheath fluid, and adjacent soft tissues such as overlying retinacula. The sagittal images are most useful for depicting abnormalities of the finger flexor and extensor tendons.

MR Imaging of Tumors and Tumor-Like Lesions of the Upper Extremity

349

Steven Shankman, Srinivas Kolla, and Javier Beltran

Many tumor and tumor-like lesions of the bone and soft tissues may involve the upper extremity. Certain lesions, however, are unique to this location. As is usually the case, MR is most sensitive to detection and most accurate in depicting the extent of involvement of these lesions. MR signal characteristics may aid in differential diagnosis. Conventional radiographs are often more specific in regard to the underlying histopathology.

MR Imaging: Arthropathies and Infectious Conditions of the Elbow, Wrist, and Hand

361

Marlena Jbara, Madhavi Patnana, Faaiza Kazmi, and Javier Beltran

The superior soft tissue contrast and multiplanar capability of MR imaging has contributed to earlier diagnosis and implementation of effective treatment for a variety of arthropathies and infectious conditions of the elbow, wrist, and hand. Because of overlapping clinical signs and symptoms, MR imaging plays an important role in delineating the features and staging of each of these conditions. This article discusses the seropositive and seronegative inflammatory arthropathies, with emphasis on early detection and surveillance, as well as gout, synovial osteochondromatosis, pigmented villonodular synovitis, tenosynovitis, and de Quervain's tenosynovitis. Certain noninflammatory arthritides and infectious conditions are also reviewed.

Index

381