

NEURORADIOLOGY ESSENTIALS

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Preface

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Ronald L. Wolf

Imaging of Spinal Trauma

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Linda J. Bagley

Approximately 2% to 3% of blunt trauma victims suffer injury to the spinal column each year, often with devastating consequences. This article discusses clinical criteria for screening for spinal injury and the increasing roles of multidetector CT and MR imaging in the evaluation of spinal trauma. Both CT and MR imaging safety issues also are addressed. Lastly, the role of imaging in the evaluation of whiplash injury, instability, vascular injury, and delayed traumatic sequelae is discussed.

Imaging of Traumatic Neurovascular Injury

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M.J.B. Stallmeyer, Robert E. Morales, and Adam E. Flanders

Traumatic injury to the major vessels of the head and neck can result in potentially devastating neurologic sequelae. Until recently, conventional angiography was the primary imaging modality used to evaluate these often challenging patients. Advances in cross-sectional imaging have improved the ability to screen for these lesions, which have been found to be more common than previously thought; however, accepted protocols of imaging evaluation have not yet been fully established. This article presents a general approach to the patient with suspected neurovascular injury. This includes a discussion of the histopathologic spectrum, clinical presentation, mechanisms, radiologic work-up, pertinent issues of the most common lesions, and some of the endovascular techniques used in their management.

Modern Emergent Stroke Imaging: Pearls, Protocols, and Pitfalls

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Mark E. Mullins

Stroke remains one of the most important clinical diagnoses for which patients are referred to the radiologist for emergent imaging. Timely and accurate imaging guides admission from the emergency department or transfer to a hospital with a dedicated stroke service, triage to the intensive care unit, anticoagulation, thrombolysis, and many other forms of treatment and management. It is important to approach each

patient's imaging needs logically and tailor each work-up, and constantly to review the entire process for potential improvements. Time saved in getting an accurate diagnosis of stroke may indeed decrease morbidity and mortality. This article discusses the current management of stroke imaging and reviews the relevant literature.

Acute Injury to the Immature Brain with Hypoxia with or Without Hypoperfusion 63

P. Ellen Grant and David Yu

This article reviews the imaging features and evolution of immature brain injury caused by hypoxia with or without hypoperfusion in the neonate and young child. Clinical presentations and available literature on mechanisms and clinical outcomes are discussed. In many of these cases, diffusion-weighted imaging does not show the full extent of the injury but detects a pattern of injury that is important in guiding clinical care. Awareness of the delayed cell death mechanisms is essential to understand diffusion-weighted imaging sensitivity and evolution and to provide the most accurate clinical interpretation, especially in cases of hypoxia with or without hypoperfusion.

Update on Multiple Sclerosis 79

Jack H. Simon

In this article the basic features of the focal MR imaging lesions and the underlying pathology are reviewed. Next, the diffuse pathology in the normal-appearing white and gray matter as revealed by conventional and quantitative MR imaging techniques is discussed, including reference to how the focal and diffuse pathology may be in part linked through axonal-neuronal degeneration. The MR imaging criteria incorporated for the first time into formal clinical diagnostic criteria for multiple sclerosis are next discussed. Finally, a discussion is provided as to how MR imaging is used in monitoring subclinical disease either before or subsequent to initiation of treatment, in identifying aggressive subclinical disease, and in monitoring treatment.

Imaging of Cervical Lymph Nodes in Head and Neck Cancer: The Basics 101

Devang M. Gor, Jill E. Langer, and Laurie A. Loevner

Imaging can identify pathologic cervical adenopathy in a significant number of patients with head and neck cancer who have no palpable adenopathy on physical examination. This article reviews nodal classification, drainage patterns of different head and neck cancers, various cross-sectional imaging features of metastatic lymph nodes from head and neck cancer, nodal staging, and certain features like extracapsular spread and carotid and vertebral invasion that the radiologist should know because they have therapeutic and prognostic implications. New imaging techniques and the role of fluorodeoxyglucose positron emission tomography imaging in recurrent disease are discussed.

Special Articles

MR Imaging of Epilepsy: Strategies for Successful Interpretation 111

Venkatramana R. Vattipally and Richard A. Bronen

The first half of this article is devoted to providing an introduction and overview for MR imaging of epilepsy. Several MR imaging epilepsy topics will be discussed in great detail in separate articles, such as hippocampal sclerosis, developmental disorders, and functional MR imaging. The remainder of this review will discuss strategies for successful interpretation of MR images from the seizure patient and how to avoid potential pitfalls.

Anatomy and Pathology of the Eye: Role of MR Imaging and CT 135

Mahmood F. Mafee, Afshin Karimi, Jay Shah, Mark Rapoport, and Sameer A. Ansari

Since the development of CT and MR imaging, significant progress in ophthalmic imaging has been made. As the technology advanced and MR imaging units improved their ability in terms of spatial resolution, the role of MR imaging in ophthalmic imaging has increased accordingly. This article considers the role of MR and CT imaging in the diagnosis of selected pathologies of the eye.

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