Kurzfassung: There are many kinds of liver diseases including diffuse involving diseases and focal liver lesions. Because of the widespread use of imaging techniques such as ultrasonography (US), computed tomography (CT), and magnetic resonance imaging (MRI), previously undetected liver lesions are increasingly being discovered. In this lecture, we discuss the common benign and malignant focal liver lesions include hemangioma, focal nodular hyperplasia, hepatic adenoma, hepatocellular carcinoma, and metastasis.

Radiology plays a pivotal role for the detection, characterization, and follow-up of focal liver lesions. Because of a combination of high safety profile, low cost, and wide availability, US is the first-line imaging modality for the liver. Although, US plays important role to detect focal liver lesions, it has limitation for characterization of focal liver lesions. CT and MRI play an important role to diagnose and characterize hepatic lesions. With the recent advent of multi-detector row CT (MDCT), MDCT provides detailed morphologic and hemodynamic information on the number, size, distribution, and vascularity of focal liver lesions, all of which are vital in guiding the clinical decision making and therapeutic plan of focal liver lesions. MRI offers increased capabilities for the characterization of liver lesions and is generally recommended as a problem-solving modality when CT fails to determine a conclusive diagnosis. Compared with CT, major advantages of MRI include higher soft tissue contrast resolution. More recently, the introduction into daily clinical practice of liver-specific MRI contrast media (ie, combined extracellular space contrast agent and a liver-specific contrast agent; gadoxetic acid, Gd-EOB-DTPA) offers the possibility to combine information of a standard MRI examination with additional functional data, which in turn yields to improved detection and characterization of liver tumors.

The differential diagnosis of incidentally found focal liver lesions is complex. Understanding the underlying pathophysiology of these liver lesions may lead to characteristic imaging manifestations, which direct the radiologist to the diagnosis. Careful analysis with the knowledge of characteristic appearances on various cross-sectional imaging in the proper clinical context, liver imaging can provide an accurate diagnosis of various hepatic focal lesions noninvasively. To formulate a practical approach to focal liver lesions, several factors must be incorporated into a clinical decision-making algorithm, including the particular clinical setting (ie, known comorbidities, underlying cirrhosis, or a known primary neoplasm), the presence of clinical signs and symptoms, the results of laboratory tests, and the critical information provided by imaging studies.

In this lecture, we discuss the role of current imaging techniques for the characterization and diagnosis of focal liver lesions. The indications, major advantages, and shortcomings of different diagnostic methods are discussed. Emphasis will be placed on key reliable features of each focal liver lesion to differentiate these lesions from other benign and malignant focal liver lesions.