**Kurzfassung:** Cirrhosis represents a process of scarring and regeneration in the liver as a response to injury and inflammation from many etiologies. While fibrosis can be seen in a variety of disorders, once the fibrosis bands become irreversible a diagnosis of cirrhosis can be made. In all instances these are accompanied by the liver creating regenerating nodules. Micro- and macroregenerative nodules are universally present in cirrhosis, and a small proportion of these go through an evolutionary process creating low-grade and high grade dysplastic foci that can go on to develop into hepatocellular carcinoma (HCC). Low grade dysplasia is very common in cirrhosis, but high grade dysplasia appears to be a key precursor for HCC formation in cirrhosis. Larger dysplastic nodules may demonstrate a characteristic MR signal pattern (increased T1 signal and decreased T2 signal), but unfortunately while characteristic, is uncommonly seen.

Understanding the underlying pathologic changes with dysplastic development and transformation to HCC will be emphasized in this lecture. This development can occasionally be seen at high quality imaging as a ‘nodule in a nodule.’ This pathway correlates with pathologic changes of decreasing native arterial and portal venous flow to nodules with development of non-triad arterial neovascularity. These combination of findings result in enhancing lesions seen at arterial phase and accelerated washout of contrast greater than liver parenchyma on delay phases, a characteristic of HCC. The spectrum of HCC development in nodules however does not always present with the characteristic appearances. The discussion will focus on key findings at MR (T2 signal, Diffusion Weighted Imaging, contrast enhancement and washout) and how one can use these in combination to differentiate benign from malignant liver nodules in cirrhosis.

**Lernziele:**
1. To gain an understanding of the varied appearances of benign regenerating liver nodules at CT and MR imaging.
2. To learn how to use different CT and MR imaging techniques to delineate characteristics that differentiate benign regenerating nodules from small and early hepatocellular carcinoma.
Kurzfassung: Liver cirrhosis is a major public health problem. The purpose of this topic is to present our experience regarding CT and MRI evaluation of benign and malignant nodules developed in liver cirrhosis based on patients explored in our radiology department, focused on the CT and MRI techniques, semiology of cirrhotic nodules (regenerative, dysplastic low-grade and high-grade, hepatocellular carcinoma, or nodule in nodule pattern), their structural changes in time and the multidisciplinary team management of cirrhotic nodules. Multislice CT evaluation of cirrhotic nodules involved a nonenhanced and enhanced multiphase CT acquisition during the arterial, portal and parenchymal phases to emphasize early hypervascular lesions and for the analysis of time washout curve. MRI evaluation of the cirrhotic liver included conventional sequences without contrast (T1 and T2wi, chemical shift artifact sequences, diffusion and ADC map) in combination with multiphase dynamic 3D T1 acquisition after intravenous administration of liver-specific contrast agents (Gd-BOPTA and in the last 5 years Gd-EOB-DTPA) including the hepatobiliary phase. Around 41% of our cirrhotic patients had liver nodular regenerative cirrhosis, liver fibrosis in association with portal hypertension; 8% of cirrhotic patients had regenerative and dysplastic nodules and 31% of patients had hepatocellular carcinoma. CT and MRI play an important role in the evaluation and follow-up of patients with cirrhotic liver disease and its complications. Multidisciplinary dialogue between the clinician, radiologist, medical laboratory scientist and pathologist allows to find the optimal solutions concerning the monitoring and correct therapeutic approach of nodules developed in the cirrhotic liver.

Lernziele:  
- To review particularities of CT and MRI techniques used to detect and characterize nodules in cirrhotic liver  
- To discuss and illustrate the CT and MRI appearance of regenerative nodules, dysplastic nodules and hepatocellular carcinoma in liver cirrhosis  
- To become familiar with the differential diagnosis and pitfalls in liver cirrhotic nodules  
- To highlight the central role of the radiologist in a multidisciplinary team in the management and the correct therapeutic decisions of each cirrhotic patient.