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JSMRM-KSMRM 2

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CMR for Ischemic Heart Disease

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Cardiovascular Magnetic Resonance (CMR) has evolved into an indispensable, non-invasive imaging modality for the comprehensive evaluation of ischemic heart disease (IHD). This lecture will provide a concise yet thorough overview of how to effectively utilize CMR to diagnose, risk stratify, and guide the management of patients with IHD.

We will begin by discussing the fundamental role of CMR in assessing **myocardial viability**, which is critical for determining a patient's eligibility for revascularization procedures. The lecture will highlight the use of late **gadolinium enhancement (LGE)** imaging, the gold standard for detecting and quantifying myocardial scar. We will explore how scar size, transmural extent, and distribution correlate with post-revascularization outcomes. A key focus will be on differentiating viable from non-viable myocardium, providing crucial information for clinical decision-making.

Next, we will delve into the utility of stress **CMR** for the detection of myocardial ischemia. This segment will cover the principles of both vasodilator stress (e.g., adenosine, regadenoson) and dobutamine stress, detailing how they are used to identify stress-induced perfusion defects and wall motion abnormalities. We will compare stress CMR's high spatial resolution and lack of ionizing radiation with other stress imaging modalities, underscoring its superior diagnostic accuracy for detecting significant coronary artery disease.

Finally, the lecture will touch upon the broader applications of CMR in IHD, including the assessment of **left ventricular function** (ejection fraction, volumes) and the characterization of microvascular obstruction and intramyocardial hemorrhage following an acute myocardial infarction. The talk will also briefly review the latest advancements, such as T1 and T2 mapping, and their emerging role in tissue characterization and risk stratification. By the end of this session, attendees will gain a practical understanding of the core CMR sequences for IHD, learn how to interpret key findings, and appreciate the immense value of this single-study approach in the clinical management of patients with ischemic heart disease.

Keywords: *Cardiac MR, Ischemic heart disease, Late gadolinium enhanceme, Stress MR perfusion*