Prošireni sažetak / Extended abstract

Identifying post-myocardial infarction patients at risk by imaging techniques

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Most myocardial infarction patients will undergo emergency percutaneous intervention (PCI) today. However, most of these patients will have diffuse cardiovascular disease and will often show more disease than a single culprit lesion. It is important to identify those patients at risk after a myocardial infarction (MI). The current guidelines suggest that the resting left ventricular (LV) function must be assessed as part of the risk stratification by both the ESC (ESC ST-elevation myocardial infarction (STEMI) in 2012)[1] as well by the ACCF/AHA (2013)[2]. The guidelines suggest that patients with an LV ejection fraction (LVEF) <30-40% and New York Heart Association (NYHA) functional class I or II should receive an implantable cardioverter-defribilator (ICD) treatment.

However, there are two major concerns to this classification and those are: 1) Are the current imaging methods accurate enough to measure this threshold in LVEF? And 2) the great majority of patients with a sudden cardiac death (SCD) have an LVEF >30%[3]. So the major question is how we can identify the patient at risk and wheter we any other possibilities to identify them by imaging[4]?

There are currently many additional imaging methods available who aimed at identifing vulnerable coronary lesions[5], such as: intravascular ultrasound (IVUS), optical coherence tomography (OCT) and near infrared spectroscopy (NIRS), to name a few. Some of these imaging methods can be used for in-depth analysis of plaque components as by example IVUS-Virtual Histology. Most of these intracoronary imaging techniques are used to identify the so-called thin-cap fibroatheroma's (TCFA's)[6,7]. Also functional measurements of coronary blood flow, e.g. fractional flow reserve (FFR)[8] or even virtual FFR by multi-slice computed tomography (MSCT)[9].

However, not a single imaging method could identify these vulnerable plaques at itself, the results up until now are somewhat disappointing. We expect that combination of the results of the individual methods by multi-modality imaging, might improve this[10]. The ultimate multi-modality assessment of the LV and the heart might be "electro-mechanical imaging"[11].

Identifying the vulnerable patient at risk after MI is a difficult task[3]. Although the imaging guidelines today recommend to measuring the LVEF at rest to identify patients at risk and who might benefit from additional treatment, there is still a large scientific debate if this is appropriate enough. More recent imaging methods are necessary and perhaps multi-modality imaging could provide better insight into the very important topic of identifying patients at risk.

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