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Her previous CMR experience includes a research fellowship at the Feinberg Cardiovascular Research Institute, Northwestern University, Chicago, USA (2004-2005), and a PhD degree on CMR from Imperial College London/Royal Brompton Hospital (2006-2010), London, UK, as well as having provided senior clinical supervision to the weekend CMR service of the Heart Hospital, UCL (2008-2010).

She has been recently elected the vice-chair of the CMR section of the European Association of Cardiovascular Imaging (EACVI) within the European Society of Cardiology (ESC).

Dear MAGNETOM Flash reader,

It is a real honor for me to introduce the first 2015 edition of MAGNETOM Flash published in conjunction with the joint SCMR/EuroCMR 2015 meeting.

Imaging is increasingly at the core of personalized cardiovascular medicine and over the last few years we have all witnessed tremendous improvements in CMR technology and in its clinical applications. CMR is becoming an integral part of the international guidelines for managing patients with cardiovascular disease. For example, in the recent 2014 ESC/EACTS guidelines on myocardial revascularization, CMR stress perfusion received a class I indication as a diagnostic test for patients with intermediate risk of CAD. The cardiology community is therefore embracing CMR as a test to offer to their patients in various clinical settings, reflecting modern cardiology practice.

The centrality of imaging, particularly CMR, in the day-to-day delivery of cardiac care is well demonstrated by the new advanced imaging department at Barts Heart Centre, London, UK. Strategically located between inpatient and outpatient cardiology services, the unit is equipped with three CMR dedicated scanners and networked to five other scanners located in allied hospitals. Its anticipated volume of 9,000 CMR scans per year shows the extent to which CMR is used in clinical practice, but also provides an excellent platform for research and educational opportunities.

Myocardial parameter mapping

A significant part of this issue is dedicated to myocardial parameter mapping, namely native T1 and extracellular volume fraction (ECV), new methods that have brought a new dimension to non-invasive myocardial tissue characterization.

Both native T1 and ECV now offer the unprecedented opportunity to non-invasively quantify changes in the myocardial structure and interstial compartment facilitating diagnosis and prognosis in a variety of cardio-vascular disease. Schelbert et al. illustrate how native T1 is generally increased in a range of acute and chronic conditions such as myocardial infarction, myocarditis or stress cardiomyopathy, and amyloidosis or other cardiomyopathic processes, respectively. Conversely, native T1 is reduced in conditions such as iron overload and Anderson-Fabry's disease. However, it is important to note that myocardial edema, fibrosis and amyloidosis can all increase native T1 values suggesting an overlap across disease categories, and the need to interpret abnormal values within the clinical context.

Whilst alteration in native T1 may result from processes affecting the myocardium, the interstitium, or both, ECV mapping specifically quantifies expansion of the interstitial space. Whilst both can represent early markers of disease, recent evidence suggests that ECV may improve risk stratification, representing a therapeutic target for therapy and predicting outcome better than traditional markers.

Lundin and Ugander from Sweden complement these concepts by presenting a series of clinical cases demonstrating the clinical utility of myocardial parameter mapping in a variety of clinical conditions. This is a great example of how this latest technology is being successfully translated into clinical practice.

However, the ability to quickly and reliably detect diffuse myocardial

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fibrosis continues to be the drive for further technical developments. Currently there are various techniques available to quantify T1 and ECV, each with advantages and limitations. After reviewing some of the most commonly used methods, Chow and Thompson from Canada illustrate the rationale and promising performance of a new sequence called SASHA[1] (SAturation-recovery single SHot Acquisition). The robustness of the SASHA sequence appears to significantly reduce systematic confounders that affect other sequences increasing their variability.

Colleagues from Brazil take us through the journey of parametric mapping applied to the spectrum of iron overload disease. Lara Fernandes et al. then present the interesting results of the All Iron Detected (AID) Project that saw the implementation of a prototype MyoMaps package[1] to increase productivity, decrease training needs and increase clinical throughput in patients with iron overload. The results of their study show the feasibility of the protocol, with a median scan time of 5.2 minutes (IQR 4 to 7 minutes) in patients with a wide age range (2 to 91 years of age). This has the potential to allow the evaluation of 70 patients in a 12-hour shift, boosting productivity to 200%. Most importantly, this does not come at the expense of compromising image quality or robust T2* quantification.

How-I-do-it

This issue has a strong focus on How-I-do-it with colleagues around the world sharing their vast practical experience on various different CMR applications that have improved their clinical practice.

CMR is not immune from the pressures of cost-reduction and cost-effectiveness dictated by the current financial climate. But challenges also represent opportunities and Pleyo et al. from Spain describe how the Cardiac Dot Engine has improved CMR efficiency with the introduction of shorter MR sequences and automated scanning techniques, which translate into reproducible and efficient studies, reduced scan time, ultimately improving patients' experience, without compromising image quality.

Similarly, Avery et al. show how the *syngo*.via MR Cardiac Analysis provides a solution to the time-consuming CMR image post-processing offering a semi-automated workflow. This system is based on a computer-aided ventricle contour detection and valve planes delineation, recognition of defined anatomical references such as the apex, anterior RV insertion point, and others, and depiction of the designated end-diastolic and end-systolic frame. This method aims at improving significantly the post-processing time, therefore reducing costs without compromising the accuracy of the analysis. This article presents a rich iconography that easily guides the readership though the use of the software with useful tips and tricks.

The article by Gottlieb and Camargo describes how CMR can be performed reliably with a standard 1.5T magnet such as the MAGNETOM ESSENZA. Whilst the system presents some limitations for cardiac imaging, these can be overcome by some adjustments and good routine cardiac image quality can be obtained. This is quite an important concept because it emphasizes that in contexts where the access to a more sophisticated CMR scanners might be limited or perhaps even prohibitive, the delivery of a CMR service is not compromised. This article is indeed an encouragement that CMR has increasingly less barriers with ease of

[1] WIP, the product is currently under development and is not for sale in the US and in other countries. Its future availability cannot be ensured.

cardiac potential even in less sophisticated systems, which represents in fact an invite to perform it more globally.

Non-contrast MR angiography

The article by Edelman et al. describes a new non-contrast MR angiography called QISS (Quiescent Interval Single Shot), a very promising alternative to standard contrast-enhanced MR angiography or CTA, particularly in those patients with renal dysfunction and contraindication to contrast media. The sequence, unique to Siemens, has been recently launched in the market.

A series of clinical cases is then presented by Carr et al. where the image quality obtained with QISS speaks for itself, particularly in comparison with a standard contrast-enhanced MRA and CTA.

QISS helps improving patients' safety and compliance with higher accuracy and better disease management, while maintaining the diagnostic certainty you need in peripheral MRA exams.

Finally, Viallon et al. illustrate the interesting MUST project that involved CMR technology in detecting structural and functional changes in both myocardial and skeletal muscles induced by ultra-endurance running. This study contributes to the understanding of adaptive response to extreme physical exercise both during exercise and in the recovery phase. The CMR protocol used for this study spanned from the standard cine and LGE technique to myocardial tagging, T1 and T2 mapping and feature tracking analysis, and the preliminary data is described in the article.

In conclusion, this issue addresses a variety of clinical topics that demonstrate the successful translation of technological developments into clinical practice aimed at improving patients' management but also increase work efficiency. The outstanding contributions from colleagues throughout the world is evidence of CMR becoming an increasingly mature technique used worldwide.

This wouldn't have been possible without the passion of the researchers around the world and certainly not without the joint dedication of the industry, like Siemens, in continuing to invest in innovation and the development of new products to address clinical needs.

Happy reading, and see you at the joint SCMR/EuroCMR 2015 meeting

Chiara Bucciarelli-Ducci