The future of EuroEcho-Imaging

By Professor Gilbert Habib, EACVI President 2014-2016

The European Association of Cardiovascular Imaging was created more than ten years ago, in 2003. Since then, the Association has grown steadily and currently has more than 5,000 members. The EuroEcho-Imaging congress – which is the largest imaging congress of its kind in the world - welcomes more than 3,500 delegates each year.

Special attention for young cardiologists

The main objective of this impressive congress is to provide up-to-date information to the cardiologists concerning echocardiography, cardiac magnetic resonance (CMR), cardiac computed tomography (CT) and nuclear cardiology. In addition, the organizers of the EuroEcho-Imaging congress want to focus on multimodality imaging and give clinical-based information about how and when to use each modality depending of the clinical presentation of the patient. Focusing on multimodality imaging, research, and – very importantly – the cardiologists of tomorrow. This has become essential as young cardiologists today are more and more imagers rather than only echocardiographers. Therefore, their educational as well as practical needs in this respect should be addressed thoroughly. The EuroEcho-Imaging congress is an excellent opportunity for young cardiologists to acquire all the necessary knowledge on each modality, thus expanding their experience and skills.

Growing number of attendees

The interest from the field into all different aspects of imaging is also reflected in the growing numbers of attendees which increased from less than 1,000 to more than 5,000 in less than ten years. The inclusion of different imaging techniques is the key to this success; this obviously attracts more doctors to take an active part in enhancing their knowledge. Over the years, the EuroEcho-Imaging congress has directed itself more towards to multimodality and dedicated a large part of its program to practical learning. This is illustrated in adding new features to the congress program – workshops and hands-on sessions – which have proven to be hugely popular especially among the young generation of cardiologists and imaging specialists.

Increasingly important societies

Additionally, the role of national and imaging societies in Europe and outside of the continent is becoming more crucial. The way other national societies manage echocardiography and other imaging technique can be very different from one country to another. The EuroEcho-Imaging congress will continue to develop into a fantastic opportunity for each country to share their own experience with others. In the end, the main objective is to put the patient at the center of the discussion and to think about disease rather than about one imaging technique or the other. Hopefully, the EuroEcho-Imaging congress will remain the bigger imaging congress in the world with more relationships with societies outside Europe developing as this will ultimately lead to better patient outcomes.

Don’t Miss

- All day: HIT Workshop on Transoesophageal Echocardiography (TOE) for beginning practitioners, Imaging Campus 3
- 10.00-11.00 EACVI General Assembly, Room Leipzig
- 10.00-11.00 Young Investigator Award session – Basic Science, Agora
- 15.30-16.30 Young Investigator Award session – Clinical Science, Agora

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Professor Gilbert Habib is Chair of the Cardiology Department (heart failure, valvular heart disease) at La Timone Marseille, France as well as director of the echocardiographic laboratory La Timone Marseille. He is also President of the EACVI (European Association of CardioVascular Imaging), Chairman of the European guidelines for management of infective endocarditis 2009 and 2015 and Chairman of the European guidelines for the use of echocardiography in infective endocarditis 2010.
Imaging for Cardiac Resynchronization Therapy: present and future

Dr. Victoria Delgado, EACVI Board member, Scientific Documents Committee

Cardiac Resynchronization Therapy (CRT) is an established therapy for heart failure (HF) patients with reduced left ventricular ejection fraction (LVEF), wide QRS complex, left bundle branch block (LBBB) morphology and >150 ms duration and who remain symptomatic (New York Heart Association [NYHA] class III-IV) despite optimal medical treatment. It has shown to be beneficial in terms of reducing morbidity and mortality and an extensive number of single-center and multicenter randomized clinical trials – the first of which were conducted in the early 1990s - have shown that CRT improves heart failure symptoms and left ventricular (LV) function and induces a significant reduction in LV volumes and mitral regurgitation.

When compared to other heart failure medical treatments, CRT is a long-term effective therapy. As a result of its sustained beneficial effect, it is not surprising that the European Society of Cardiology guidelines consider CRT a class I indication for patients with drug-refractory heart failure symptoms, LV ejection fraction <35%, and wide QRS complex (>120 ms). However, there are some issues which remain controversial and need ongoing research such as the selection of patients, the definition of response, efficacy of this therapy in patients with non-LBBB QRS morphology and intermediate duration (120-140 ms) and whether CRT optimization should be based on imaging or on electrocardiogram (ECG) or not be done at all.

Selection of patients

Despite its beneficial effects, CRT still has a 30% non-response rate based on current inclusion criteria, which suggests inadequate specificity when patients are selected for CRT. Although the inclusion criteria for CRT implantation (New York Heart Association functional class III-IV, LV failure symptoms despite optimized medical therapy, LV ejection fraction <35%, and QRS duration >120) have not been significantly modified, other parameters might be helpful in assessing which patients are most likely to benefit from CRT and thus improve the selection process. These parameters are measurement of LV dyssynchrony, detection of the presence and extent of myocardial scar tissue, and assessment of the site of latest mechanical activation (positioning of the LV lead, targeted to the latest activated segment or just in posterolateral regions avoiding the LV apex).

Definition of response

Furthermore, it can be disputed what the definition of response is: either an improvement in symptoms or an improvement in LV systolic function and reserve remodeling. And perhaps improvement in survival would be a clear response, too. It has been shown that patients with QRS duration >140ms and patients with LBBB configuration show higher CRT response rates compared with patients with narrower QRS duration or with non-LBBB morphology. Non-invasive imaging techniques have proposed several parameters to characterize LV mechanical dyssynchrony. It has been demonstrated that LV mechanical dyssynchrony is an independent determinant of long-term survival, and therefore, the evaluation of this parameter in candidates for CRT seems clinically relevant.

Research has been done in 3D imaging modalities which are able to provide more robust and accurate parameters of LV mechanical dysynchrony to predict CRT response and long-term survival. However, CRT response is not exclusively determined by LV mechanical dysynchrony. There are other pathophysiological factors of importance, such as extent and location of myocardial scar and LV lead position which have been associated with response to CRT.

Current 3D imaging modalities, including echocardiography, magnetic resonance imaging (MRI) and nuclear imaging, provide comprehensive and robust information on the main determinants of CRT response: LV mechanical dyssynchrony and site of latest mechanical activation, extent and location of myocardial scar, and venous anatomy.

Non-LBBB and CRT optimization

It can be questioned if imaging helps the efficacy of CRT in patients with non-LBBB QRS morphology and with intermediate duration (120-140 ms) as they do not seem to benefit from a reduction in all-cause mortality and heart failure hospitalizations such as patients with complete LBBB morphology. In patients who do not respond to CRT, optimization of device settings has been proposed in order to improve LV systolic function and symptoms. However, landmark trials have not consistently demonstrated a significant impact on the outcomes of patients who undergo CRT optimization versus patients in whom the settings of the device are not optimized. Of note, the trials included heterogeneous populations with patients who already showed a benefit to CRT and in whom optimization of the device may be unnecessary. Trials including patients who do not benefit from CRT would have been more appropriate to answer the question on the role of CRT optimization. Another discussion point is whether CRT optimization should be based on imaging or on ECG or perhaps not be done at all.

Personalized medicine

As it is thus clear that the current criteria for patient selection for CRT are not optimal, it will be worth looking into the role of personalized medicine in which all pathophysiological determinants of response to CRT are integrated and evaluated. This approach may prove to be helpful in further improving outcomes for patients. For instance, patients with significant LV dyssynchrony, no or minimal myocardial scar tissue (especially in the LV segments which are targeted by the LV lead) and with an LV lead placed at the site of latest activation are likely to benefit from CRT. However, the opposite is true for patients with more synchronous LV contraction, extensive myocardial scar (or transmural scar in the segments where the LV lead is positioned) or an LV lead position far from the site of latest activation (LV lead mismatch); they will most likely not benefit from CRT.

Multimodality imaging for patient selection

There is reason to believe that the implantation of the LV lead according to an integrative evaluation of LV dyssynchrony, site of latest activation and location and extent of myocardial scar is associated with increased rates of response and improved long-term survival. The selection of the appropriate imaging technique to evaluate these parameters will depend on the availability and expertise of the center and the presence/absence of specific characteristics of the patients. Taking all the above into account, echocardiography will remain the first choice imaging technique for the evaluation of patients eligible for CRT. The current echocardiographic technologies permit accurate assessment of LV dyssynchrony and identification of the site of latest mechanical activation and these data can be combined with the venous anatomy and the presence, transmural extent and location of scar tissue obtained with MRI or computed tomography. The potential of specific imaging software allowing for segmentation of MRI data displaying the cardiac veins in relation to the location of transmural scar has recently been demonstrated. It is without doubt that future studies will determine the precise role of non-invasive imaging in the selection of patients who are candidates for CRT.
Professor Roberto Lang was born in Buenos Aires, Argentina where he went to medical school at the University Nacional de Buenos Aires. He completed his training in Internal Medicine and Cardiology both in Israel at the Hadassah Medical Center, Jerusalem, and at the University of Wisconsin in the United States of America. From the very start of his medical career, he has always been interested in cardiology. He counts Professor dr. Zvi Klein – whom he came into contact with while training in Israel – as one of the influential professionals who inspired him and proved to be an example to him as a young doctor. He became aware of the fact that Professor Klein was always performing clinical research at the time with M-mode echocardiography and phonocardiography. Klein was therefore the first to instill a thorough interest in performing clinical research in him and Professor Lang remains forever thankful for that.

Proud of work in three dimensional echocardiography

As for his own work, Professor Lang is most proud of the work his group performed on three dimensional echocardiographic imaging. They started with this modality many, many years ago when it was brand new and their extensive work over the years has resulted in multiple studies showing the advantages of the third dimension. Specific lines of interest that Professor Lang feels strongly about is the use of three dimensional echocardiography for the quantification of the cardiac chambers as well as the quantification of the valves and regurgitant jets.

Fusion imaging

When considering cardiovascular imaging in general, one of the fields which Professor Lang finds really interesting is fusion imaging. With this technique, registration is used to different imaging techniques which are then fused in order to provide additional imaging information. He and his group at the university of Chicago are doing quite a lot of work where they fuse the coronary arteries from computed tomography (CT) with three dimensional echocardiography whereby they assess the function of the heart.

Bright future for cardiovascular imaging

According to Professor Lang, the future of cardiovascular imaging is bright. He reckons that it has become clear over the last couple of years that cardiac imaging possesses the ability to guide interventional procedures in the cath lab. Also, by using three dimensional echocardiographic images, it is indeed possible to quantify a vast amount of parameters in a more precise fashion and with less variability than with other modalities or techniques. Looking back into history until now, Professor Lang feels that cardiovascular imaging in general has the ability to make a very quick diagnosis and put each cardiac patient and non-cardiac patient on a correct pathway for physicians with regard to treatment.

Professor Lang, American Society of Echocardiography Past President, Chicago, USA

Professor Roberto M. Lang, MD, is Professor of Medicine and Director of the Noninvasive Cardiac Imaging Laboratory at the University of Chicago, USA. Being an internationally renowned cardiologist and specialist in echocardiography, he uses his vast knowledge of cardiac imaging techniques to evaluate patients with a wide variety of heart conditions, including heart failure and valve disease. Dr. Lang was a pioneer in the development of three-dimensional echocardiography, a state-of-the-art method to observe heart function. He is a past president of the American Society of Echocardiography. In addition, he has been named one of the top cardiologists in Chicago by Chicago magazine. Professor Lang is currently in charge of the Valve Clinic, where he actively collaborates with interventional cardiologists, as well as cardiac and vascular surgeons, to treat patients with structural heart disease. His clinical interests are valvular heart diseases, aortic disease, echocardiography, general cardiology, heart failure, hypertension and coronary artery disease. He is a Member of the American Society of Echocardiography, the American College of Physicians, the American Federation of Clinical Research, the Central Society for Clinical Research, the Chicago Heart Association and the Heart Failure Society of America.
Why is presenting at a congress a challenge?

Dr. Maria Magdalena Gurzun, cardiologist, Eurocolab, University of Medicine and Pharmacy “Carol Davila”, Bucharest, Romania, Army’s Center for Cardio-Vascular Disease Bucharest, Romania

“Presenting at the congress is a kind of challenge because you have to be fully prepared. You are part of the large machinery which is necessary to have a good congress for all participants. I have done presentations before in the EACVI Club 35 and by gaining experience I am still learning and developing my skills. The most important thing that I have learned through my previous presenting experiences is not to be nervous, although this can be a challenge, especially for first time presenters! When you have a message to convey, you need to be calm in order for your audience to gain and learn from it. A good and thorough preparation helps. Beforehand, I go through the presentation with my co-presenters in order to follow the same line in the session. Also, sharing ideas and thoughts at poster sessions is helpful as I can obtain information which I might use in my presentation. What you are presenting has to be very clear so everyone understands what you are trying to bring over. I have a little trick to make sure my talk is crystal clear: I practice with my friends. They are not trained as cardiac imaging specialists or cardiologists. If they understand my presentation, then I know it is good enough. Being a presenter at the congress is great; it is fantastic if your experience is important to others as it means that your work counts. It gives me confidence, which extends to my daily practice. Colleagues might consult me if they know I gave a presentation on a certain topic and I feel more appreciated by them which is wonderful. Ultimately, it makes me do better for my patients and I would recommend all young doctors to try and have a presenting experience.”

What does it mean for a young doctor to be a presenter?

Dr. Matteo Cameli, Cardiologist University of Siena, Italy and PhD fellow Advanced Heart Failure and Heart Transplantation, Umeå University, Sweden

“I must admit that I was very enthusiastic – and a little anxious too – when it became clear that I was going to present at Euroecho Congress this year. It made me feel proud at the same time, as it is very flattering to be invited to give a presentation, considering my young age. It takes a lot of hard work, but in this association, I am not an exception at all. Young doctors have a voice within EACVI which I think is very important. From a personal perspective, as a member of Certification & Accreditation Committee, a member of the Web & Communication Committee and Leading Manager of LinkedIn EACVI Club 35 Account and have become EACVI Club 35 Ambassador for Italy, I can only agree that there is a great chance for us young ones. Apart from the experience of presenting and interacting at such an important congress, it also offers a great chance for me to create a link with other colleagues by meeting and networking with so many attendees. The very best experts in imaging are present and I hope to empower myself by talking to them and learning a lot from them as well. It’s a great chance for my career and I would definitely advise other young doctors to try and get involved in major congresses like this too. It will provide you with more point of reference in the future. Over the past years, I have been attending similar congresses and have witnessed other young physicians presenting. There has been a definite improvement as it becomes more and more common for young doctors to take part like this. Hopefully, other societies will apply this too; for instance, the National Association of Cardiology in Italy is now following the same pathway.”

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