SUPPLEMENTARY MATERIAL

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Selection of the Best of 2016 in Echocardiography in Heart Valve Disease

Selección de lo mejor del año 2016 en ecocardiografía para la valoración de las valvulopatías

To the Editor,

As a diagnostic modality, echocardiography is not only the cornerstone of the entire clinical management of patients with valvular heart disease, but is also a guide to all current nosological perspectives on valve diseases. Although the echocardiography corpus in this field might seem complete, the technique is constantly being updated due to technological advances and the continual transformation of health care practice, making it an active field of research, development, and innovation. Various areas have produced notable advances in the last year.

Ultrasound is spreading at such a rate that ultrasound equipment may one day be available in almost all health care centers. The opportunities for patients to benefit in this setting are indisputable but neither the equipment nor the training and experience required for a reliable echocardiographic study are universally available.[1] An important problem concerns the use of portable ultrasound equipment by noncardiac physicians within a structured health care system: the ideal situation would be to take advantage of this new resource without depriving patients of an exhaustive, recorded and recoverable, measured and informed cardiac ultrasound study that counts on the support of an appropriately trained operator. To examine this issue, a prospective study evaluated the usefulness of hand-held cardiac ultrasound performed by primary care physicians with the remote support of cardiology imaging specialists. This strategy reduced cardiac ultrasound requests by a third but showed considerable discrepancy in the evaluation of mitral stenosis,[2] supporting the belief that valve disease grading is one of the technically most demanding clinical situations. Because of the difficulty of evaluating valvular heart disease, the implementation of quality assurance programs is essential, even in echocardiography laboratories of excellence. A study of an internationally renowned university echocardiography laboratory showed that simple measures such as the systematic use of nonstandard echocardiographic windows can improve the reliability of measurement of aortic stenosis mean gradient, an established but highly critical technique in clinical practice.[3] Valvular heart diseases pose a major challenge to all health care systems, in both their echocardiographic evaluation and their clinical management. Clinics specializing in valvular heart disease managed by a cardiac imaging specialist are being popularized as a useful way to achieve close patient follow-up of patients and optimize treatment. An example of the benefits of this strategy is provided by a study of patients with hemodynamically severe but asymptomatic aortic valve stenosis who underwent close, twice-yearly, clinical follow-up. At the 6-monthly scheduled visits, the patients' symptom status was verified, a complete physical examination was carried out and blood pressure was measured, and an electrocardiogram, blood analysis, and complete echocardiogram were conducted; the latter was performed by an experienced operator. The patients attending this specialized clinic benefited from early identification of the criteria for surgical treatment and could undergo valve replacement with a lower degree of deterioration and better survival.[4] Thus, both the patients and the system benefit from the versatility of echocardiography; in the first example, hand-held cardiac ultrasound is conducted at the point of care by family physicians to reduce the number of unnecessary ultrasound examinations[2] and, in the second example, an echocardiographer performs a comprehensive echocardiographic examination in the clinic to avoid delays and optimize results.[4]

In the field of cardiac imaging, there is exponential technological development, and the new tools run the risk of becoming obsolete even before they are clinically validated and widely used. However, this situation is not an issue for real-time 3-dimensional echocardiography (3D echo), which has two main advantages: first, it allows the cardiac anatomy to be seen from a new perspective, storing and reconstructing datasets that help to better understand the classic tomographic ultrasound and second, it also permits the study of morphological features that could not

previously be evaluated. An example of the first advantage is a study that used multiplanar 3D echo reconstruction and anatomical references to reliably assess the structures of the tricuspid valve. This method established 6 echocardiographic cross-sections permitting the localization (now precise) of the possible tricuspid valve findings.[5] The second advantage is illustrated by anatomical evaluation in the context of structural interventional cardiology. In this situation, beyond the indication, device selection, and implant monitoring, 3D echo provided information on the anatomofunctional mechanisms influencing procedural outcomes,[6] which is why this technique is destined to play an even greater role in the treatment of valvular heart diseases.

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Selection of the Best of 2016 in Cardiac Computed Tomography

Selección de lo mejor del año 2016 en tomografía computarizada cardiaca

To the Editor,

Research in cardiac computed tomography (cardiac CT) in 2016 has been marked by analysis of 3 important studies published in 2015, namely the PROMISE, SCOT-HEART and PLATFORM trials, which were designed to assess the potential role of cardiac CT in clinical practice. In the PROMISE trial, conducted in patients with intermediate-risk chest pain, the clinical results of cardiac CT were similar to those of ischemia testing. In the SCOT-HEART study, adding cardiac CT in patients who had already been studied with a conventional method improved the final diagnosis, allowing the adoption of a more suitable treatment approach. Finally, the PLATFORM trial showed that the combined noninvasive study of the coronary anatomy and coronary flow reserve with CT drastically reduced the number of patients undergoing invasive coronary angiography with a normal result (from 73% to 12%).[1]

A reflection on the PROMISE trial is that patients with obstructive coronary artery disease only accounted for 15%, while it had previously been calculated with the Diamond and Forrester

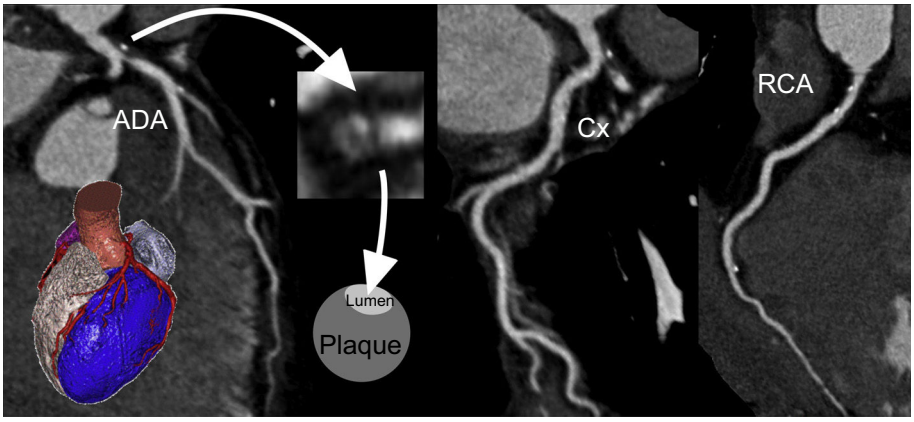

Figure. Cardiac CT assessment of the coronary anatomy in a patient with chest pain. There is a large plaque in the distal trunk, which extends to the anterior descending artery and causes severe ostial stenosis. The low-attenuation, obstructive plaque causes vessel remodelling. It therefore fulfils all the high-risk criteria. ADA, anterior descending artery; CT, computed tomography; Cx, circumflex artery; RCA, right coronary artery.