I would like to thank Dr. Guillermo Kreutzer, a pioneer in cardiovascular surgery in Argentina, for enriching the editorial (2) that I was able to write for the Argentine Journal of Cardiology. However, his enlightening report on the history of our profession leads me to consider some aspects that I discussed in the editorial. The topic I dealt with was not the historicity of the cardiac surgical practice but, specifically, the technical progress that allowed for transapical aortic valve implantation. Regarding this unique and exclusive concept, I presented records of those who were the first to perform implantation of aortic valve prosthesis. Only about aortic valve surgery, because it was the topic being analyzed. There is no mistake at all on this point, because in 1952, Hufnagel and Harvey (3) performed the first aortic valve implantation on a patient with acute aortic regurgitation. The procedure was performed without extracorporeal circulation in the descending aorta (which is precisely the tendency of the latest techniques). The authors considered an improve of 75% of the regurgitated flow to achieve a better quality of life. (4) The comment made by Dr. Kreutzer regarding Cutler’s (5) surgical management of a mitral stenosis in a girl in 1923 is every bit as good as the achievement, but we are discussing different issues, as he himself explains when he literally says “although it was not a valve implantation”. The historical processes exist, independently of the affinity we may have with them, or of the “dubious rationality” that Dr. Kreutzer confers to the first procedure by Hufnagel-Harvey. I did not mean (and I am far from it) to evaluate the quality of Hufnagel’s implantation on the first prosthesis; I simply meant to refer to the history in which I am trapped, with no chances to get free from it. A slave to the event that took place. Another aspect I would like to clarify is that in the editorial, I did not refer to any surgical act as having biblical implications. I simply said –with reference to the Ecclesiastes– that there is not a previous environment and/or predetermined factors. It is for the brief moment that allows us to compare ideas.

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Prevalence and Association of Hypertension with the Different Components of the Metabolic Syndrome

To the Director

The purpose of this letter is to express my conviction that basic and clinical research for prevention is one of the largest and most significant legacies we can leave the next generation. When beginning to read the scientific article by Paragano et al., (1) this assessment on primary prevention can be immediately observed. Hypertension, through the elevation of “blood pressure”, may be the factor that adds more cardiovascular risk to the inherent moderate (aggregate) risk of the normotensive patient with a diagnosis of metabolic syndrome by anthropometric and biochemical criteria. (2) Thus, the mere presence of high levels of blood pressure corresponding to the first stage (and cut-off for diagnostic criterion) of the current classifications associates the patient with high cardiovascular risk, and includes him/her in the scheme of management for this group of patients, with more aggressive objectives concerning the control of cardiovascular risk factors.

The correct diagnosis of hypertension according to clinical practice guidelines (and with a correct technique) is crucial to properly categorize patients and set a management plan for the situation based on these guidelines (evidence). (3) This way, a patient can ensure the quality of the interventions he/she really needs, and avoid those that could cause harm.

The age of patients with metabolic syndrome is related directly and linearly to the frequency of hypertension as one of its diagnostic criterion, unlike other criteria, which is mostly related to habits and environmental and/or predetermined factors. It is for
this reason that, when comparing among populations with metabolic syndrome, it is essential to rule out differences in the prevalence of hypertension associated with age, since it is the most common component, especially among men and Hispanics. (4)

The appropriate diagnosis of metabolic syndrome is as relevant as the detection of the subclinical target organ damage initiated by it in the cardiovascular continuum. This subclinical target organ damage may be revealed through simple clinical maneuvers such as carotid auscultation, measurement of the atrial-brachial index or determination of left ventricular hypertrophy by ECG, or through low-cost lab tests, like plasma creatinine and albumin/creatinine index in a urine sample. When possible, it is recommended to perform ventricular hypertrophy detection by echocardiography, measurement of intima-media thickness (carotid echo-Doppler), assessment of atherosclerotic plaques, and determination of pulse wave velocity. (5)

Given this complex situation, I eventually agree on the conclusions of the article, in that the components of the metabolic syndrome increase the prevalence of hypertension. This also indicates us the need for early assessment of the metabolic profile in all hypertensive patients, and of intervening actively to prevent the direct impact on the incidence of cardiovascular disease.

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**Authors’ reply**

We thank Dr. Obregón for his interest in our article; we agree with his comments and appreciate his contribution on this issue.

We could consider that the pathological rise in blood pressure (BP) would be one component, sometimes with late onset, of a complex array of cardiometabolic risk factors. The frequent coexistence of arterial hypertension with diabetes is widely known. (1) Moreover, its relation with obesity or changes in the glucose metabolism suggest that the basis of this association may respond to common pathophysiological links. Insuline resistance, endothelial dysfunction or inflammation are some of the possible mechanisms. The metabolic syndrome is a combination of cardiovascular risk factors that includes all these situations, (2) and this circumstance exposes its clinical relevance, especially in hypertensive patients. We believe that identifying the factors that define it is a useful strategy for the management of arterial hypertension based on individual risk. Especially in those cases in which the diagnosis is made but none of its components has reached levels of therapeutic intervention for themselves.

Our results suggest that the different constituents of the metabolic syndrome play a major role in increasing the BP. In addition, they proved to be independent predictors of arterial hypertension, like sex and age. Assessment and treatment of patients should consider this issue to manage BP properly, especially given that arterial hypertension is one of the cardiovascular risk factors with greatest epidemiological impact, and that its control is still far from desirable. (3) Maintaining a healthy weight and a balanced diet, and doing physical exercise are fundamental guidelines for controlling the array of cardiovascular risk factors, putting an emphasis on the importance of prevention. (4,5) Finally, it is quite common that hypertensive patients who get to consultation are suspected of having target organ damages as a result of hypertension and/or the effect of other added metabolic factors. It is key to resort to the different complementary tests for these patients so as to detect this damage, because of the additional risk it entails. In general, and according to what has been expressed by Dr. Obregón, these practices can be helpful at the time of implementing an optimal therapeutic strategy.

**Antonio J. Paragano, MD**

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**Authors’ reply**

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**Antonio J. Paragano, MD**

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Prevalence and Characteristics of Myocardial Bridging in Multidetector-Row Computed Tomography Coronary Angiography

To the Director

It is very interesting to have access to local data like those reported in the work by Carrascosa et al., about a non-invasive technique such as the multislice computed tomography (MSCT) of myocardial bridges (MB), a frequent condition for those who perform interventional cardiology. Its diagnosis, prevalence, and characteristics vary according to the method of assessment: invasive coronary angiography, MSCT, and autopsy.

Regarding the MB, its definition includes two analyses: an anatomic one (intramyocardial coronary) and a dynamic one (systolic compression).

Angiographically, systolic reduction of arterial lumen by compression, which disappears during diastole (milking effect) is considered diagnostic of a myocardial bridge.

Conversely, in MSCT, luminal reduction can also be detected in diastole. Its clinical relevance is controversial. In most cases, it is a benign, incidental finding.

However, it has also been associated with myocardial ischemia, myocardial infarction, arrhythmias, or sudden death.

According to the depth of their course, myocardial bridges are classified into:

- Superficial or incomplete myocardial bridges: those in which their intramyocardial course is superficial. They are rarely associated with ischemia, so its clinical expression is uncommon and therefore they are subdiagnosed.
- Deep or complete myocardial bridges: they can be associated with ischemia, because they may cause a milking effect due to their depth; in most cases, this effect is clinically manifested.

If we consider the anatomic and dynamic varieties that the MBs present (complete and incomplete, with or without compression), and what each method assesses (MSCT, coronary angiography), we can explain:

- The higher prevalence of MBs found in MSCT compared with coronary angiography.
- The significant marked absence of systolic compression in complete MBs, found in the study by Carrascosa et al.

The MSCT can assess coronary vessels and myocardium, which explains why we find more MBs through this method – compared with the coronary angiography – since the diagnosis of this invasive study is based on compression of the artery during systole, dynamic assessment.

We can then infer that the MBs subdiagnosed by coronary angiography are the incomplete MBs, and are those which lack compression and therefore are difficult to visualize through coronary angiography.

There lies the difference in prevalence between both methods.

The incidence of MBs varies whether their diagnosis is obtained through coronary angiography (0.4% to 4%) or through autopsy (15% to 70%).

The value reported in the study of Carrascosa et al. was 35.18%, similar to what other studies have reported.

Furthermore, from the “dynamic” analysis with MSCT (compressible versus non-compressible), it is interesting to point out that compressible systo-diastolic MBs (caliber reduction > 50%) have the highest clinical expression, although this cut-off point is not validated functionally or with coronary angiography.

The MSCT is a very useful non-invasive method to diagnose MBs, but is currently not valid for functional assessment.

Furthermore, the resolution at an end-diastolic or end-systolic phase is different, making it difficult to assess and quantify MBs.

It should be pointed out that the 64-slice MSCT has demonstrated higher sensitivity to detect MB, compared with 16-slice, 32-44% versus 3.5-5.75% respectively.

In conclusion, the MSCT is a non-invasive method of diagnosis that can be selected to diagnose this condition because it shows higher prevalence than the one obtained by coronary angiography; however, it is currently unable to determine the functional or physiological meaning of the MBs.

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Prospective Electrocardiogram-Gated Multidetector Row Computed Tomography Coronary Angiography. Analysis of Image Quality and Radiation Dose

To the Director

We have read with great interest the article published by Carrascosa et al., (1) in which the quality image in prospective electrocardiogram-gated multidetector row computed tomography coronary angiography (PMDCT-CA) is analyzed. The study analyzes in detail the image quality in 50 patients evaluated with PMDCT-CA, and compares them to a control group of 50 patients who underwent retrospective ECG-gating (RMDCT-CA), which is the common gating technique. The authors did not find substantial differences in the baseline characteristics and the reasons to indicate the studies between the groups of patients undergoing PMDCT-CA and RMDCT-CA. The main finding of the study is that the image quality was similar in both techniques, evaluated with a semiquantitative score, the image noise, and the signal to noise and contrast to noise ratios, and that the radiation dose was significantly reduced. Radiation dose reduction was 73% in patients with PMDCT-CA, compared to the usual gating with RMDCT-CA. Mean radiation dose was 3.5 ± 0.45 mSv for PMDCT-CA, far below the radiation dose for PMDCT-CA, which is 14-18 mSv, and for other techniques to assess coronary artery disease, like the thallium SPECT (24 mSv), and the MIBI SPECT (6-8 mSv). Invasive coronary angiography was performed in 30 of the 50 patients, and the authors’ report of the individual analysis including all segments shows good sensitivity, specificity, negative predictive value (NPV) and positive predictive value (PPV) of PMDCT-CA for the detection of coronary stenosis of 94.74%, 81.82%, 90% and 90%, respectively. While MDCT-CA is the most accurate non-invasive test for diagnosing coronary artery disease, there are three main limitations for the more extensive use of this technique: The higher radiation compared with other diagnostic methods, the uncertainty on the prognostic value of the findings of MDCT-CA regarding the studies suggestive of ischemia, and the high cost of this practice. There is increasing evidence that large lipid plaques and coronary stenosis findings have a prognostic value which is independent from myocardial perfusion findings in the SPECT. (2) As far as costs, there are clinical situations such as patients with suspected cardiac pain with ECG and negative enzymes who, if they could have access to MDCT-CA, it could be cost-effective compared with a routine management strategy. (3) This work, together with other recent works, provides new information about radiation dose reduction with PMDCT-CA. (4) A diagnostic study, with characteristics similar to those of the RMDCT-CA and with no artifacts, can be performed on ideal patients with HR < 60 bpm and regular heartbeat. Author’s findings strongly suggest that it is possible to accurately diagnose coronary artery disease and to perform follow-up studies with a lower radiation dose than that of other non-invasive techniques.

Diego Pérez de Arenaza, MD

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Authors’ reply

First of all, we would like to thank Dr. Diego Pérez de Arenaza for his interest in our work and for his valuable words.

As he states in his comment, medicine today has a diagnostic tool that allows not only to determine the degree of coronary stenosis but also to know the characteristics of the coronary artery disease (type of plaque, composition, degree of vascular remodeling), with a non-invasive method, a low radiation dose, and diagnostic accuracy.

We believe it is of great importance and, above all, a responsibility for the physician devoted to performing MDCT-CA, to use all the available tools to maximize the effective radiation dose reduction within the appropriate clinical setting, while paying attention to image quality in order to preserve the high diagnostic accuracy of the method.

Carlos Capuñay, MD

Clinical and Functional Profile of Patients with Systolic Heart Failure and Renal Dysfunction

To the Director

The unquestionable achievements obtained with drug therapy for heart failure (HF) showed a dramatic reduction in mortality for this group of patients. A mortality rate of 52% per year reported in the CONSENSUS I (1) changed to a rate of 17% per year for a group of patients with similar characteristics in the treatment arm of the MERIT-HF trial. (2)

These advances face us to new challenges: an unceasing growth of this disease over the past decades,
with more elderly patients for whom HF prevalence grows exponentially (8% in > 80 years of age as opposed to less than 5% in > 65 years of age), (3) and also more complex patients, and with more comorbidities. These associated conditions include renal failure (RF), so imbricated with HF that some authors have coined the term “cardiorenal failure” (CRF). Nonetheless, a definition of CRS has not been properly agreed upon, and it is accepted that it would be defined as the presence of concomitant cardiac and renal failure, with volume overload and resistance to usual treatments. -{}-

Even though RF has already been recognized as an independent factor of morbimortality in patients with HF, (4) and even though the ADHERE registry showed which levels of urea and creatinine in the blood—together with arterial hypotension— were strong mortality markers (5), and that between 30-50% of the HF carriers develop RF defined by a glomerular filtration rate < 60 ml-minute, those who presented with CRS were systematically excluded from the clinical trials. Therefore, the best treatment for this significant population of patients remained poorly defined, because many times the RF was underestimated and considered a relative contraindication to some effective therapies.

In this way, the work by Acosta et al. (6) provides relevant clinical data that shed light on the understanding of this medical condition.

By analyzing the pathophysiology of this syndrome, HF patients are found to have clinical findings in common with those who develop RF: older age, diabetes, smoking, dyslipidemia, atherosclerosis, hypertension, which would finally be precursors of increased macrovascular and microvascular damage in both organs. Likewise, deterioration of the renal function causes disorders, such as renin-angiotensin-aldosterone system activation, endothelial dysfunction, anemia, proteinuria, and inflammatory mechanisms, which play a significant role in the progress of cardiovascular deterioration. Data are consistent with the outcomes of the work of Acosta et al., and suggest that the activated mechanism is not exclusively renal hypoperfusion due to low cardiac output.

In this work, it is likely that not finding coronary artery disease as the etiology of HF in patients with RF is related to the number of patients in the sample, and to the impossibility to analyze different severity groups among them.

Finally, recognizing distinctive characteristics of worse prognosis should encourage the search for effective therapeutic measures.

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Regarding the drainage of the pericardial cavity, in the surgical subxiphoid pericardiectomy (SSP) approach, the surgeon makes a path between the cavity and the preperitoneal abdominal cavity (eventually to the peritoneum) with resection of a hole in the diaphragm and the pericardium; the path is the same for the procedure performed with balloon, but there is no diaphragm resection; then it could be inferred that drainage to the abdomen is lower and what remains is the path to the pleural cavity through the lesion in the diaphragmatic folds of the parietal pleura. This would explain the left pleural effusion so common in the surgical procedure.

It only remains for me to congratulate Dr. Kevorkian and his group for an excellent report on the safety and feasibility of the PBP, which, in my opinion—and as in the case of the SSP—should be performed in patients with relapsing CT or etiologies with high rate of relapse.

José A. G. Álvarez, MD

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Authors’ reply

First of all, we would like to thank Dr. Álvarez for his interest and his constructive feedback about our work.

We agree with the guidelines on the diagnosis and management, (1) in that (acute, chronic, constrictive) pericarditis, pericardial effusion with or without cardiac tamponade, as well as other congenital defects, tumors, and pericardial cysts can be included in the spectrum of pericardial diseases. Viral acute pericarditis is the most common infection of the pericardium, and it rarely progresses with significant effusions and tamponade, so its treatment is directed to symptom relief, anti-inflammatory drugs, antivirals, and/or corticoids. (1)

Severe pericardial effusion with cardiac tamponade is rare, and its etiology is generally neoplastic, tuberculous, myxedema, uremic, and parasitosis. (1, 2) In these patients, drainage of pericardial effusion may be necessary in addition to the management of their underlying disease, due to the hemodynamic involvement.

In our population, patients diagnosed with severe recurrent or symptomatic pericardial effusion who had clinical and echocardiographic signs of cardiac tamponade were referred to pericardial fluid drainage and percutaneous balloon pericardiectomy (PBP), by decision of the attending physician. A high percentage of our work consists of primary indication of PBP due to patients’ very poor overall medical condition and high surgical risk, with no other therapeutic option. This way, a second effusion and a possible tamponade—requiring an urgent procedure—would be prevented. The literature offers reports on the use of primary percutaneous balloon pericardiectomy on both oncology patients and patients with other etiologies. (3, 4)

To sum up, we believe that the PBP is a simple procedure with low morbidity and mortality, which is a good therapeutic alternative to the traditional surgical pleuropericardial window for critical patients with severe pericardial effusion and/or cardiac tamponade.

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