Editor's Page

The Evolving Landscape of Interventional Cardiology: "Because We Should"

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"The physician must be able to tell the antecedents, know the present, and foretell the future – must mediate these things, and have two special objects in view with regard to disease, namely, to do good or to do no harm. The art consists in three things – the disease, the patient, and the physician. The physician is the servant of the art, and the patient must combat the disease along with the physician."

Hippocrates 1886I (2,5:300)

The ancient dogma that specifically asks the doctor to uphold the "do no harm" principle has not always been an easy guide to follow. This has been especially true in the last few decades, which saw the advent of a plethora of new therapeutic techniques, procedures and devices, all promising to "do good". Technological advances have always been close to the heart of interventional cardiologists; after all, since the nascence of interventional cardiology in 1976 with Andreas Gruentzig,[1] the field has relied heavily on new technology to improve outcomes, expand indications and take over new realms of cardiac therapeutics. However, the last few years have been marked by two significant changes in the course of interventional cardiology: a reassessment of the indications for percutaneous coronary intervention (PCI) and a gradual shift of the interventional vanguard from the coronary arteries to structural heart disease.

Despite the ageing of the population, there has been a consistent trend towards lower annual numbers of coronary revascularisations,[2,3] which cannot be explained only by a trend towards a decreased prevalence of coronary heart disease (CHD). Studies have consistently shown that in stable CHD there are limitations to the benefit conferred by PCI, and interventionalists have embraced the idea that not all angiographically evident lesions should be treated with PCI. In this line of thought, modalities for assessing the functional severity of lesions, mainly fractional flow reserve, have become part of the catheterisation laboratory's instrumentation and are likely to be more widely utilised in the future, especially considering that in some countries, including the United States, medical reasons for selecting patients more likely to benefit from revascularisation have been supplemented by legal ones, after lawsuits for "inappropriate" PCI procedures.

The re-evaluation of the role of PCI in the treatment of CHD has been counterbalanced by an expansion of the role of interventional cardiologists in structural heart disease. This movement has been vitalised and dominated by the success of a single procedure, namely transcatheter aortic valve implantation (TAVI), arguably the first significant success story in this area since transcatheter percutaneous mitral valvuloplasty for mitral stenosis.[4,5] Since the positive results of the PARTNER trials,[6] TAVI has been established as a therapeutic option in inoperable or high-surgical-risk patients with symptomatic severe aortic stenosis. The near future will most probably bring about two important changes in this field. The first will be the addition of more options in terms of valve systems, aimed at improving outcomes and reducing complications; the issue of device deliverability—with a concomitant reduction in peripheral vascular complications—is of great importance for substan-

tial betterment of the modality. This evolution can potentially expand TAVI applicability in situations previously considered as contraindications (e.g. bicuspid aortic valves). The second anticipated change in TAVI is related to the range of patients considered as suitable candidates. As the technology improves and results prove to be durable over time, the question of offering it to patients with fewer comorbidities and lower surgical risk will inevitably be posed (clinical trials enrolling patients with intermediate surgical risk are ongoing: PARTNER 2, SURTAVI). Another, less certain, aspiration is taking interventional procedures for structural heart disease beyond TAVI; promising new techniques and procedures are under way, with mitral regurgitation being in the focus of industry's efforts, although outcomes have been less promising – the mitral valve is proving to be more rugged terrain than the aortic valve.

"Necessity is the mother of invention", as an old proverb goes. One should comment, though, that this is not always true in today's world. When inventions, new devices and modalities, are truly answers to existing problems, they advance medicine to new frontiers, helping patients and fulfilling doctors' aspirations – TAVI seems to be such an example. If, on the other hand, a novel procedure or device is introduced just "because we can", and not "because we should" (following the paradoxical claim that "for every solution there is a problem") things can go very bad very quickly. Fortunately, the community of interventional cardiologists has the will and the means to separate the wheat from the chaff and the future looks promising.

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