EDITORIAL

From heroic surgery to Ecclesiastes

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Surgery was born "heroic". It needed the surgeon's strength to solve the mechanical emergencies that required his professional service. Many centuries later –during the last third of 19th century– it managed to become scientific with the inclusion of the concepts of asepsis and antisepsis, and the development of anesthesia, at first with dramatic characteristics for its pioneers. However, the epic extended beyond these advances, by the need to explore deep inside the body using invasive techniques and approaches to fight the violent temper of some diseases. Cardiovascular specialty did not evade from this paradigm. Regarding valve implant, the first record about the therapeutical efforts in this field is indeed exciting in the search for truth, a stigma that is the fair cause for science. In 1952, Hufnagel and Harvey (1) performed the first prosthetic valve implant in a patient with acute aortic regurgitation. The valve was implanted in the descending thoracic aorta with no extracorporeal circulation. Some time later, in 1960, the development of the extracorporeal circulation (Gibbon, 1954) made it possible for Harken (2) to perform the first implant of an artificial prosthesis in the subcoronary position.

Some years later, the advance of less invasive techniques to explore organs were successfully used in cardiovascular therapies. In 1966, Rashkind, (3) with the use of a balloon, made it possible to enlarge the foramen ovale in congenital heart defects, in order to increase oxygen saturation in "blue patients". This was the beginning of interventional cardiology, with the strategy of using new technologies to find solutions for diseases through minimal intervention. At present, the minimally-invasive diagnostic and therapeutic procedures are writing a new page in this fascinating adventure of knowledge.

Life expectancy increase has turned aortic stenosis into the most frequent valve disease, and the cause of high morbimortality in this aging population. For the coming decades, it is feasible to expect an increase in the frequency of this disease. About one third of these patients are not suitable for conventional replacement surgery, due to age, comorbidities, or multiorganic risks. In 1985, the balloon valvuloplasty was introduced, (4) which resulted in mediocre performance in post-surgical follow-up. At present, it is restricted to very special situations in which it is necessary to decrease the transaortic gradient of the critical patient, in order to undergo surgery right afterwards. As a result of this step, Cribier, et al. (5) had the creative daring of performing the first transcatheter implantation of an aortic valve prosthesis in a critical patient with aortic stenosis. A slightly prior record of this technique should not be disregarded when building up the knowledge on this field. In 2000, Bonhoeffer, et al. (6) managed to perform for the first time a percutaneous pulmonary valve replacement in a child, mounting a bovine jugular vein valve inside the stent in pulmonary position.

Further evolution of this percutaneous technique, in favor of the risk entailed in conventional surgical replacement for this group of patients, allowed for an in-hospital mortality of 20%. (7) It was also evidenced that prognosis for discharged patients to remain stable was good. This study of Gruber, et al. (7) evaluated 25 patients (gradient of 44.2 ± 10.8 mm Hg, and Euroscore of 11.0%) and was performed with femorofemoral extracorporeal circulation using the retrograde approach through the aorta. The study reports that the unprecise position of the prosthesis was responsible for half of the procedural failures. These data are relevant facts in the analysis of the work of Battellini et al., (8) who, through a minithoracotomy, performed a transcatheter aortic valve implantation through the cardiac apex. The authors offer new perspectives by achieving –with a minimally-invasive *hybrid* technique– significant advances related to the inconveniences in transseptal and retrograde approaches. By avoiding the aorta in elderly patients, this transapical technique minimizes aortic wall manipulation, resulting in less chances of embolic migration and eventual stroke. Another favorable circumstance is that the implant can be performed with stand-by extracorporeal circulation through cannulas inserted into the femoral artery and vein, which the authors call "safety net". Of the 192 patients treated with this transapical approach, 89% did not require extracorporeal circulation. And this is a good perspective. Both 8.9% mortality rate at 30 days and 94% ± 3% survival rate at 6 months in the last 72 patients (second series) show the good sense to steer clear of the complications of extracorporeal circulation, and avoid the passage through the femoral artery path.

Considering that these patients undergo the minimally-invasive procedure because conventional surgery is not possible for them, in some cases due to atherosclerotic, calcific or "porcelain" arterial walls,

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the proposed access can prove a clear advantage. As expressed by the authors, the disadvantage is the minithoracotomy. However, new apical procedures via endoscopy are being currently developed. In recent cases, valve placement, which is apparently more efficient with this new technique, has achieved better results in a crucial step towards final development, by means of software techniques (DYNA CT).

Paralell review on the subject, as well as the introduction of a new strategy for aortic valve implant with 192 patients treated with transapical approach, make the study of Battellini, et al. (8) a frontier in this technological era, in which the last old "heroic" surgery fragances develop. Cardiovascular surgery is leaving behind those times in which surgeons worked only with their hands, brain, and heart, in search of alternatives for their patients. The "heroic" times in his art is under review according to opportunities and needs. We will not consider the term *hýbris* –impurity, in Greek– as such in this progress attained by the fusion of different skills, but we will still be nostalgious for that ancient discipline that has benefited from the achievements of Matas (endo-aneurysmorrhaphy, 1888), Tuffier (aneurysm surgery, 1902), Forssmann (first human cardiac catheterization, 1929), Dubost (first aortic aneurysm replacement, 1951), Favaloro (direct coronary surgery, 1968). (9) The essential voluptuousness of this achievement has given way to the *hybrid* cardiovscular surgeon, which is not detrimental of his quality; on the contrary, it boosts his faculty to achieve a superior performance by including different disciplines. Cath-lab based on therapeutic intervention and biological knowledge has become indispensable to complement his achievements. But the horizon, as opposed to eternity, warns him that the only absolute is the temporal degradation of his achievements. If he wants to continue in this development, he will have to pray as in the Ecclesiastes: *"he that increases knowledge increases pain"*.

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