

# Cardiac Surgery and the Elderly

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Cardiac surgery continues to play a key role in our therapeutic arsenal against many heart diseases. This is still the case despite the recent and striking progress regarding specific drugs or different forms of cardiac intervention. However, in relation to the elderly patient, this therapeutic modality is one of the fields where age-based discrimination has been practiced for years, that is, the ageism referred to in the English-speaking literature. Age has been, and to a great extent continues to be, a core issue when establishing indications and contraindications in the different protocols under discussion.

In this context, 3 main questions need answering. The first is to define what indications we are discussing and whether these are the same as those established for younger patients. The second is to determine surgical risk in relation to mortality and morbidity, with the understanding that comparisons should be based less on age (older vs younger) and more in relation to what alternatives to surgery are available in every specific case, regardless of the patient's age. The final question attempts to define and identify the risk factors determining a worse prognosis and, on that basis, to establish strategies to reduce this risk.

The answer to the first question is easy. In the elderly, as in the young, there are 2 large areas of surgical activity: coronary surgery and valvular surgery. Coronary heart disease is strongly linked to the changes associated with the aging process and, to the extent that risk factors continue to be better understood and controlled, the age of onset has been delayed until it has become a typical geriatric pathology. In relation to valvular heart disease, within which context rheumatic heart disease has become negligible, the problems are associated with so-called degenerative aortic stenosis, which is also more frequent as age increases and, to a lesser extent, with certain forms of mitral valve regurgitation. Other types of surgical

intervention exist, but in quantitative terms these are little more than symbolic.

In order to answer the other 2 questions, the article presented in this issue of the *Revista Española de Cardiología* (Spanish Journal of Cardiology)<sup>1</sup> is especially relevant, in addition to other similar articles that are increasingly common in the recent cardiology literature, some of which we refer to.

The amount of interest raised by this subject can be appreciated by searching PubMed for the terms "elderly" and "cardiac surgery" showing that 801 references have appeared in the last 2 years alone. The number of publications contributing information on this issue is continually increasing, and there are several general reviews providing guidance and educational information.<sup>2-5</sup>

According to data provided by different updates, in recent decades the age of heart surgery patients has strikingly increased, while at the same time mortality and complication rates have decreased whatever the reference age limit. A German registry that recorded a total of 97 123 interventions during 2006, showed that 9.6% of the patients undergoing heart surgery that year were more than 80 years old, whereas the registry for 2005 showed this figure to be 8.4%.<sup>6</sup> Similar data can be found in other countries, such as the United Kingdom.<sup>7</sup> The positive outcomes of these interventions are sustained even in populations older than 90 years.<sup>8</sup>

The indications for intervention that emerge from the different studies are basically the same as those established for any other age, with the exception that, when the functional reserve is low and more comorbidity present, a far higher degree of attention is needed and a much more individualized assessment for every specific patient. In any case, and taking as reference one of the most common situations, degenerative aortic stenosis, recent publications in Spain have shown some excellent short-term and long-term outcomes in octogenarian patients who needed aortic valve replacement.<sup>9</sup> These are very positive results and similar to those found in surgical series in other countries.<sup>10</sup>

Short- and long-term risk assessment should take age into account, but never as an isolated component. This fact emerges from the different indexes that assess risk in this type of surgery, such as the New York State, Cleveland Clinic, Magovern, or EuroSCORE indexes.<sup>11</sup> The EuroSCORE, created by the European Society of Cardiology (ESC) some years ago, appears to be the most

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complete and has proven to be an excellent prognostic marker of early and late outcome in coronary surgery.<sup>12</sup> It provides global information which is of higher value than some of its components when considered individually, among which are age itself, renal function, ejection fraction, or concomitant peripheral artery disease. The value of the EuroSCORE has been specifically studied in octogenarian patients. The main conclusion regarding this population was that, with the exception of age, the remaining factors analyzed did not predict an increase in mortality or morbidity.<sup>13</sup> This type of risk assessment has also been evaluated and validated in Spain,<sup>14</sup> showing that this index tends to overestimate risk and yields results that do not always match those obtained in other countries.<sup>1,15</sup>

All studies show that age is a negative risk factor when taken in isolation, either when measuring mortality or other potential factors of poor prognosis, such as the risk of kidney failure.<sup>16</sup> However, the only elements that, at any age, can be considered as involving prohibitive surgical risk are multiorgan failure, chronic liver disease, severe lung disease, and extreme undernutrition.<sup>2</sup> This list may also possibly include, at a different level, advanced cognitive deterioration.<sup>13</sup> It must be reemphasized that choices should never be made simply on the basis of being older or younger, but between the possible alternatives for a given individual of any age.<sup>7</sup>

In any case, risk should be minimized as far as possible.<sup>17,18</sup> Bearing in mind that age is an unmodifiable factor, the following have to be brought together to achieve this aim: *a)* establishing a correct indication for surgery as a better alternative to other nonsurgical options; *b)* identifying comorbidities and the possibility of intervention; *c)* assessing the suitability of the surgical techniques chosen in relation to the individual characteristics of the patient and the experience of the team itself; and *d)* having a multidisciplinary team available after the intervention that includes, together with health-care professionals, the family and a carer to ensure good short- and long-term follow-up.

The involvement of the elderly person in this context can be extremely helpful, both in the preoperative phase, when undergoing geriatric assessment to identify the risks and address them, and during the postoperative phase, when preventing and controlling potential medical complications and collaborating in planning and completing postoperative follow-up.<sup>19,20</sup> In fact, this approach has been successfully followed in Spain for some time.<sup>21</sup> Similar considerations can be taken into account when assessing cardiac risk in the elderly person, with or without heart disease, who should undergo other major surgical procedures.<sup>22,23</sup> The Spanish Society of Cardiology itself has established guidelines on this issue that include special considerations regarding the older patient.<sup>24</sup>

When referring to a population group that, due to age, has limited life expectancy, the subject of quality of life

is important and has been the subject of numerous studies. One study of special interest was conducted in Switzerland on a group of octogenarian patients undergoing coronary surgery, valvular surgery, or combined surgery. The initial results were good, with 4.4% mortality and a hospital stay of 14 days. The 5-year survival rate was also good. Perhaps the most striking aspect of this work is the spectacular improvement in the quality-of-life tests both in the immediate phase and during 5-year follow-up.<sup>25</sup> On the other hand, poor quality-of-life after recovering from surgery is an element of poor long-term prognosis regardless of the patient's age.<sup>26</sup>

All the above can be summed up as follows: *a)* the age of patients scheduled for heart surgery, whether due to coronary disease or aortic, or mitral valve replacement, has been steadily increasing in recent years; *b)* surgical risk as such increases with age, but this risk can be fully assumed when the indication is rationally established and the individual circumstances of the patient are taken into account; and *c)* regarding the elderly, comprehensive geriatric assessment of the patient scheduled for surgery is essential and should take into account possible comorbidity, life expectancy, the functional situation, and the expected social support that may be available after surgery.

All this leads to the conclusion that, in line with the authors' own words, "cardiac surgery in selected octogenarians has outcomes similar to those obtained in other elderly individuals of a less advanced age, including those with complex diseases, with good medium-term survival rates and quality of life."<sup>1</sup> In the final analysis, there are 2 main keys that can serve as reliable guidelines for correct action in Spain: not to discriminate on the basis of age, and to do everything as well as possible, applying common sense and adapting to the individual characteristics of each patient.

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