years. In their study of 1399 patients undergoing AVR, PPM had a negative effect on late survival for patients younger than 70 years but did not influence late survival in patients older than 70 years.

Mohty and associates² similarly found that AVR, with either a bioprosthesis or a mechanical valve, does not increase late mortality in patients older than 70 years. As Moon and colleagues¹ outline in their discussion of the study's limitations, they do not address the effects on late functional state or left ventricular mass regression, and moreover, they do not mention quality of life (QOL).

In my opinion, it is very important to consider a good QOL as a goal for most operations. Especially in the elderly population, it is important to maintain or improve QOL in addition to prolonging life. Koch and coworkers⁵ found that factors other than prosthesis/patient size ratio influence functional QOL after AVR. Yamaguchi and colleagues⁶ suggested that improvement in QOL can be expected after heart valve replacement in patients older than 70 years. However, their study population was different from that of Moon and colleagues¹ and included mechanical and bioprosthetic valves placed in multiple positions; additionally, we do not know whether the PPM occurred in the AVRs in the series of Yamaguchi and colleagues.⁶

PPM affects left ventricular remodeling, surgical outcome, and late mortality, and therefore should be considered a diseased state.² It is important to know whether PPM in elderly patients influences recovery after AVR.

If Moon and colleagues¹ have data about the QOL of their 1399 patients, the information derived from these data could help us understand how PPM affects QOL and would be highly relevant in the care of elderly patients undergoing AVR.

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PROSTHESIS–PATIENT MISMATCH DOES NOT AFFECT SURVIVAL AND QUALITY OF LIFE IN THE ELDERLY HAVING BILEAFLET PROSTHESES IMPLANT

To the Editor:

We read with interest the article by Moon and colleagues evaluating the impact of prosthesis–patient mismatch (PPM) on the long-term outcomes for elderly patients having aortic valve replacement (AVR).¹ The study evidenced the lack of influence on survival by PPM after implantation of biologic prostheses in elderly people.

We would be interested to learn from the authors whether they evaluated the impact of PPM on incidence of bioprosthesis degeneration at follow-up.

We agree with authors' consideration, discussed in the Comment section, of the inopportunity of aortic root enlargement in this subset of patients, and we also support the isolated AVR for aortic stenosis.

We recently have published a series on the topic of PPM and reported comparable conclusions.^{2,3} However, we would like to share with the authors our different policy regarding the choice of mechanical prostheses, and we would like to receive their consideration about this.

In our view, the increased life expectancy has increased the risk of reoperation for structural degeneration of a bioprosthesis during long-term follow-up. Life expectancy in septuagenarians can be 14 to 15 years, and the durability of a bioprosthesis could be inferior despite the engineering improvements. To reduce the probability of reoperation in the eighth or ninth decade of life, we apply precise selective criteria to the choice of biologic or mechanical prosthesis.

As reported in our previous studies,^{4,5} the choice of prosthetic implants for old patients was fundamentally guided by the consideration of patient's biologic age and associated with the foreseeable life expectancy. We chose mechanical devices for elderly patients who reasonably had a life expectancy of more than 10 to 12 years. Moreover, patients already receiving long-term anticoagulation for chronic atrial fibrillation were offered a mechanical prosthesis. Biologic prostheses were preferred for those patients with contraindication to oral anticoagulation or those in whom general senescence status or associated multiple noncardiac comorbidities, or both, suggested a life expectancy of less than 10 years. The incidence of anticoagulation-related complications is very low, with a freedom from hemorrhagic event of 96.9% ± 0.013% at 10 years.

Our institution includes an outpatient clinic that monitors anticoagulation therapy in a number of elderly

patients. A medical team updates the anticoagulation therapy for each patient following a uniform protocol of anticoagulation. In our experience, the use of anticoagulation in elderly people is safe, and quality of life is not negatively influenced by check of international normalized ratio.

On this basis, we have reported our results in terms of impact of PPM (moderate, severe, or absent) on survival in elderly people receiving mechanical prostheses implants. In our series, the incidence of severe PPM during the follow-up was very low. The presence of severe or moderate PPM did not influence long-term outcome, left ventricular mass regression, and quality of life in a population of septuagenarians. On the basis of our experience, we use isolated aortic valve replacement with a mechanical prosthesis, which represents a judicious alternative in elderly people to bioprosthesis implant.

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Reply to the Editor:

I would like to thank the groups from Naples and Pittsburgh for their interest in our recent study examining the impact of prosthesis-patient mismatch (PPM) on long-term survival in patients greater than 70 years of age. It is important to note that we did not specifically investigate the role of PPM on tissue valve degeneration, but it is likely to play a role given the potential impact of pressure gradients on leaflet durability. However, as demonstrated by Fann and associates from Stanford,¹ age clearly impacts the rate of structural valve degeneration, such that even with first- and second-generation prostheses, freedom from structural failure at 15 years exceeds 90% in patients over 70 years of age. It is our hope that newer prostheses with anticalcification treatments, low pressure fixation, and better flow characteristics yielding lower transvalvular gradients will demonstrate increased long-term durability, but only time will tell.

I think we all agree that the population is growing older and living longer across the globe. For example, in the United States, life expectancy has increased from 67 years for men and 75 years for women in 1970 to 75 years for men and 80 years for women in 2005,² a change that would, in and of itself, shift the crossover age rightward for recommending a mechanical over biologic valve during aortic valve replacement (AVR). At the same time, however, lifestyle issues, at least among my patient population, have become increasingly important with the desire to avoid lifelong warfarin more appealing than a potential one-time "AVR-for-life." This has led to an increasing percentage of well-educated patients in their 50s, 40s, and even

30s and 20s, selecting bioprosthetic over mechanical valves, at least in the aortic position. We do agree that, although a redo AVR in a 40- or 50-year-old patient carries little risk, a redo in an 85- or 90-year-old patient is a much less desirable proposition. Vicchio and colleagues³ have developed a well-structured algorithm for selecting biologic versus mechanical prostheses in elderly patients, facilitated, no doubt, by their institution's outpatient anticoagulation monitoring program, which boasts (appropriately so) a very low incidence of bleeding complications in elderly patients.

An additional shortcoming of our study is that it did not assess the impact of PPM on functional status or quality of life. In a previous study from our unit, we found that quality of life following AVR in octogenarians, quantified using the Medical Outcomes Study Short Form-36, was similar to the age-matched general population, but we did not assess the independent impact of PPM.⁴ Clearly, there are patients who will benefit from the presence of a diminished gradient over time. However, it remains my contention that, although it is important to avoid PPM in younger patients by either enlarging the root or implanting a prosthesis with favorable flow characteristics, elderly patients with limited preoperative functional status or significant comorbidities are better served with a "get in and get out" approach during AVR.

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