EDITORIAL COMMENT

Transcatheter Aortic Valve Implantation
A Snapshot From the United Kingdom*

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Transcatheter aortic valve implantation (TAVI) is now increasingly performed, and >30,000 patients with severe aortic stenosis and contraindications to or high risk for surgery have been treated so far. The technique is still in its infancy, but evidence has rapidly accumulated through observational studies (1), device-specific registries (2,3) or national registries (4–6), and randomized clinical trials (7,8).

The U.K. registry presented by Moat et al. (9) in this issue of the Journal is an important contribution to our knowledge in the field for several reasons. It is a real-life registry that represents all cases of TAVI performed in the United Kingdom between 2007 and 2009 in 25 accredited centers. The U.K. investigators should be acknowledged for being able to achieve such a level of completeness not only in enrollment but also in the 100% recording of fatalities, which is one of the original features of this registry.

This registry is also of interest because it covers a diverse experience, which is different from published studies on device-specific registries. In fact, the authors used all available approaches, with a preference for transfemoral at first, as is usual, but the transapical approach and a few transaxillary approaches were also used. The 2 types of devices available in Europe were used in an approximately equal manner (5). That could give a sense of what will happen in the future when most centers will use varied devices and approaches, as is the case in percutaneous coronary inter-

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vanvention, to offer the most appropriate treatment to the individual patient.

The results in this registry were good, with a 97% procedural success rate and an “acceptable” rate of complications when taking into account the patients characteristics: stroke 4.1%; myocardial infarction 1.3%; pacemaker 24% or 7%, according to prosthesis; moderate to severe aortic regurgitation 13.6%; and major vascular complications 8.4% in the transfemoral cohort.

These results are in line with recent series and underline the high procedural success rate that is no doubt the product of a combination of careful training, mostly provided today by the companies but to be taken over in the future by the scientific societies, and perhaps more importantly, careful teamwork between cardiologists and surgeons. The study here also stresses some important points for improvement in this young method, that’s to say the need to decrease the incidence of cerebrovascular accidents and vascular complications as well as the occurrence of moderate to severe aortic regurgitation.

Even if Moat et al. (9) may be somewhat over-enthusiastic by qualifying their results as “long-term outcomes,” the results presented here are among the longest available to us, as 2-year outcomes are available for >200 patients. Here again, the survival curves are in line with the data available up to 2 years and beyond in the literature. Importantly, the number of patients included and the duration of follow-up allowed the identification of predictors of midterm mortality, the first of which is cardiac: low left ventricular ejection fraction. The data on improvement in left ventricular function after TAVI are scarce but suggest that TAVI may be more effective than surgery at improving left ventricular function in patients with low ejection fraction. However, this group of patients needs to be investigated further as it represents, in many centers, a relative contraindication, and these patients were excluded from the randomized PARTNER trial (7,8). The predictive value of flow reserve should also be explored in this context as well as the importance of preventive coronary revascularization and balloon valvuloplasty as a bridge to TAVI. The second independent predictor of 1-year mortality was noncardiac: the presence of chronic obstructive pulmonary disease. This finding leads us to ask ourselves 2 questions. First, we should be sure that the patient really has severe aortic stenosis as the main causative factor and not chronic obstructive pulmonary disease associated with only moderate aortic stenosis; second, the contribution of noncardiologists is essential for patient selection to avoid performing TAVI in patients who have limited life expectancy regardless of valve disease and, even more so, limited potential for recovery after the procedure. The third predictor is a procedural factor: presence of moderate to severe aortic regurgitation. That has already been suggested by 2 registries (4,6) and also raises the issue of patient selection, in particular the strategy of imaging to appropriately size the
annulus and select the prosthesis (10) as well as to evaluate magnitude and location of calcification. The presence of moderate to severe aortic regurgitation may also be due to technical factors and is dependent on the positioning of the valve, which will no doubt be improved in the future by better imaging and improvements in the design of delivery catheters and valve prostheses. It is mandatory to continue identifying predictors of poor immediate outcome and, perhaps even more importantly, of subsequent attrition, which occurs frequently in the current series with fatality rates of >30% at 2 years.

This registry, of course, has limitations, and as nicely stated by Moat et al. (9), “Like all registries, ours is only as good and credible as the quality of the data within it.” The future registries should use the new VARC classification for reporting adverse events (11), to allow for better comparison of the outcomes between trials, in the comparison of devices and techniques, and as a consequence better analysis of predictors.

In conclusion, TAVI is a promising technique and the data in this registry add a significant piece of evidence in support of the statement that, for high-risk or inoperable patients, when performed in properly trained centers, safety is acceptable and midterm survival is satisfactory. All our efforts to pursue the development of this technique should aim at improving patient selection both by a dedicated medicosurgical team and by improving procedural performance through careful training and improvement in technology, and also by adequately evaluating randomized studies as well as good-quality registries that represent real life and are a necessary complement to the former.

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### REFERENCES


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