In this paper [1], Di Mauro et al. have analysed their own experience in surgical ventricular reconstruction (SVR), considering the results achieved with two different surgical strategies: a volume reduction-oriented surgery versus a more shape-oriented technique.

In my opinion this elegant paper can be, in some way, misleading for different reasons:

(i) The definition of the Dor procedure is not completely correct: Dor, in his original description of the procedure and in subsequent papers, stressed that the primary goal of this surgery is the exclusion of all scar tissue from the left ventricular cavity, and he has given great attention to the septum, that, if involved, must be excluded [2]. In Dor’s surgical population, there are patients treated for ventricular enlargement with almost exclusive involvement of the septum. In all of Dor’s publications, it is well stressed that a correct surgical procedure must achieve a known volume and this can be obtained easily using a sizer. This technical detail avoids the mistake of leaving too small a cavity or leaving too big a cavity that can neutralize the benefit of the procedure. Because an ellipsoid shape of the left ventricle is more physiological and can induce its easier emptying of the left ventricle, a shaper with a physiological ratio between the longitudinal and the transverse diameter was introduced in clinical practice. The volume of this device is chosen according to the patient’s body surface area. The surgeon, with the sizer inside the cavity, can be easily guided not only in choosing to use or not a patch to rebuild the cavity (in our experience a patch is used in half of the cases), but also in trimming the patch, which can have very different shapes and surfaces according to the anatomy of the underlying ventricle. Diastolic dysfunction is a very controversial topic and often is suspected when the surgical results are not as expected. In the paper published in NEJM in 2009 showing the results of the STICH trial Hypothesis 2 [3], the worsening of diastolic function after SVR is considered as a negative counterbalance on the positive effects of volume reduction. However, this hypothesis is not supported by consistent data. It is amazing to observe that in almost all papers dealing with the clinical results of SVR diastolic dysfunction is considered, but few studies report measurements performed before and after the procedure. Furthermore, the degree of diastolic dysfunction is also debated. In 2008 Castelvecchio et al. [4] showed that, in a population of 146 patients undergoing SVR, diastolic dysfunction was present in 95% of the cases before surgery, after the procedure, the filling pattern was unchanged in 72%, improved in 10% and worsened in 18%. The sphericity index seems not to be a good parameter to describe the shape of a ventricle and it does not impact the diastolic function. Indeed, the baseline Conicity index (as obtained from the apical to short-axis ratio in the four-chamber view) and a small volume reduction with respect to the baseline volume are the strongest indicators of worsening diastolic function after SVR. Diastolic dysfunction is a complex matter; considering the final shape of the reconstructed ventricle as the major determinant of diastolic dysfunction may be totally misleading.

(ii) It is always difficult to compare different procedures performed in two different periods. This paper describes a long experience covering 24 years; 107 patients were treated from 1988 to 2001, with a volume reduction strategy, and 294 were treated from 2001 to 2014 with shape-oriented surgical techniques. In such a long period, the expertise of the surgeons is certainly changed, as well the medical treatment and the patients’ profile. The treatment of acute myocardial infarction—with the introduction of new drugs and the extensive use of primary PCI—is nowadays very different from what it was in 1988. We see now a type of ventricular remodelling different from the remodelling observed in the past when the classical left ventricular dyskinetic aneurysm was the most frequent anatomical presentation.

(iii) According to the data published in Table 1, the left ventricular volumes (EDVI and ESVI) are identical but Figure 3 shows a volume reduction of 15% in the older series of patients (VR) and of 32% in the more recent series (CS). We can argue that, in spite of the fact that the VR population had better EF, less mitral insufficiency and smaller volumes, the reduction was not enough. All publications dealing with SVR show a good volume reduction to be at least 30% or more, because the residual volume is the greatest risk factor for death and MACE at the medium and long-term follow-up [5].

(iv) The follow-up is completed in 100% of patients over an observation period of 24 years. This is a point of great strength of this paper and the authors have to be congratulated for this titanic effort.
The authors identified mitral surgery as a major risk factor for all-cause mortality and major cardiovascular events at 10 years (OR 2.7), cardiac death (OR 2.3) or any event (OR 2.6). Mitral valve surgery was performed only in 22% of the patients in the VR group and in 61% in the CS group. Having said that, I have some difficulties in understanding the reason why survival is better in the CS group compared with that in the VR group. Probably, this is due to the fact that, at the 10-year follow-up, the number of patients at risk is 44 of 107 in the VR group and only 32 of 297 in the CS group. I think that is determined only by statistical management. Torturing the numbers, they will admit everything.

In the discussion the issue of cardiac output is considered. This is a very interesting matter of discussion. All the data published in a clinical setting showed that the great majority of the patients did not exhibit low cardiac output syndrome with the exception of patients with very recent AMI. Their output is normal and often is higher than normal. These patients are in high NYHA class because no functional reserve is present. SVR optimizes the mechanics of the LV, bringing the output in a normal range, and consequently improves the functional reserve.

This paper is important because it brings attention to the importance of having a good shape at the end of the procedure. However, we know very well from the literature that an enlarged left ventricle is the most important prognostic factor that negatively affects survival [6, 7]. An ideal ellipsoidal shape with a large residual volume is an error, particularly if a large portion of akinetic tissue is left in the cavity. The major goal of the procedure is to achieve a reduction in the left end-systolic volume (less than 70 ml/m²) [8, 9]. A sizer with a known volume and with a relative physiological shape that helps in standardizing the procedure and in predicting the final result can be an easy and cheap way to achieve this result.

REFERENCES