


**APPENDIX. CONFERENCE DISCUSSION**

Dr C. Mestres (Abu Dhabi, United Arab Emirates): You showed that there were some differences in hospital stay, but did this actually translate into some economic savings?

Dr Glauber: We have yet to perform any additional statistical analysis regarding the economic aspects and the relative hospital costs. We have demonstrated that there was a shorter hospital stay in favour of direct home discharge or dismissal to the rehabilitation facility, but possibly we will be able to perform this analysis in the future to complete our work.

Dr S. Cicak (Istanbul, Turkey): I have two questions. My first question is regarding the incidence of postoperative stroke. Compared to the full sternotomy group, it is much lower in your group, and this is in contrast to some other studies, especially because of the difficulties with deairing when using the mini-thoracotomy approach. What is your strategy for deairing? Do you use CO2? What kind of deaeraging procedures do you apply for the minithoracotomy approach in patients 80 years of age and older? Survival and cause of death based on 1100 cases: collective results from the UK Heart Valve Registry. Circulation 1997;96:3403–8.

Dr Glauber: Another important issue on the perioperative stroke regards the different phases in our experience. Most of the patients submitted to the standard conventional approach to aortic valve replacement were operated 6, 7 years ago, from 2001 to 2008.

Dr Mestres: I think this is a bad problem in methodology because there are consecutive series and the matching was only one to one. We understand the problem.

**Dr Glauber**: Regarding the second question, the blood transfusion? In previous studies, our centre has demonstrated that minimally-invasive approaches, both minirsternotomy with right anterior thoracotomy as well as right minithoracotomy compared with full sternotomy, are important factors to reduce blood transfusion, but we did not have sufficient data to include them in the current study, that is why I did not present them. But we are convinced that shorter incisions with excessive procedures within the thorax might contribute to lower blood loss and consequently to a reduced need for blood transfusion.

Dr C. Mestres: I might have missed it, but I do not think that at least a contribution of antegrade perfusion was an important factor to a lower incidence of perioperative stroke in the right minithoracotomy group.

With respect to the deairing procedure, we usually put both the ventricular and aortic vents to optimize the deairing procedure. Usually we use CO2 flood in the operative field to reduce air microparticles in the heart chambers, and I think that our careful strategy to perform accurate cannulation and to do the most accurate purse-string placement are important to reduce the incidence of stroke. It may be defined as a less-touch technique. We usually do the purse-strings and carefully cannulate the ascending aorta with a low systemic pressure.

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Dr Glauber: Another important issue on the perioperative stroke regards the different phases in our experience. Most of the patients submitted to the standard conventional approach to aortic valve replacement were operated 6, 7 years ago, from 2001 to 2008.

We read with great interest and admiration the article by Gilmanov et al. [1] comparing right anterior minithoracotomy with full sternotomy in octogenarians undergoing aortic valve replacement (AVR). To do this, they developed a rigorous propensity score analysis including 40 variables in the model (Table 1) [1]. However, and despite studying an octogenarian cohort, where frailty is prevalent, no measures of frailty or ‘biological age’ (in spite of ‘chronological age’ were considered. Frailty has become a high-priority theme in cardiovascular medicine. Frailty from the French ‘frêle’, meaning of little resistance, is a biological syndrome that reflects a state of decreased physiological reserve and vulnerability to stressors. Cardiac surgery is one of the biggest acute iatrogenic stressors to which the patient’s resiliency will determine their postoperative course [2]. The Frailty ABCs (Frailty Assessment Before Cardiac Surgery) prospective study showed that slow 5-m gait speed was associated with a 3-fold increase in postoperative mortality or major morbidity [3]. Gait speed, as the best measure of frailty, contributed incremental value above the Society for Thoracic Surgeons risk score (area under the curve 0.70 for risk score alone versus area under the curve 0.74 for risk score plus gait speed). Patients with a slow gait speed and a high risk score had a 43% incidence of mortality/morbidity, whereas those with a normal gait speed and a low to intermediate risk score had only a 6% incidence. It is evident that frail patients who undergo cardiac surgery have higher rates of postoperative mortality, morbidity, prolonged length of stay, and need for discharge to facilities. Conversely, cardiac surgeons and cardiologists are still wondering whether frail patients who undergo less invasive interventions have improved outcomes, although this is at times taken for granted [2]. We think that this study [1] is a failed opportunity to shed light on whether minimally invasive AVR is a smaller stressor than conventional AVR and this leads to better outcomes in frail patients.

Conflict of interest: none declared.

**References**

After reading the eComment by Hernandez-Vaquero et al. [1] on our original article [2], we would like to express our gratitude to the authors for their nice feedback and their interest in our paper.

Before answering the cited criticism, we remind that the missing data regarding geriatric evaluation, namely frailty and poor mobility, have already been acknowledged in the Limitations section of the article [2]. We completely recognize the importance of vulnerability of the senile patient, but the earliest patient enrollment dates back from 2001, when the concept of frailty was not so clearly linked to the patient’s outcomes in cardiac surgery. Mainly, it was not before the introduction of transcatheter valve procedures that inoperability of a patient due to frailty or comorbidities was extensively investigated [3]. It would be interesting to analyze the impact of minimally invasive heart valve surgery on the postoperative recovery of frail patients, but unfortunately it was not possible within the limits of this retrospective study [2]. However, we continue to investigate the effects of minimally invasive approaches on the immediate recovery after heart surgery, and our centre is actually a contributor to a multicentre study dedicated to preoperative poor mobility.

The data presented in the original study clearly favour the minimally invasive approach, with shorter times of mechanical ventilation and hospital stay and a greater proportion of patients discharged to the rehabilitation facility or directly home. We interpret these findings as a direct consequence of the less invasive character of the right anterior minithoracotomy, with less biological harm, or less biological price to pay, associated with minimal access aortic valve replacement (AVR).

As demonstrated on Figure 1 of the original article, since 2009 there was a distinct trend to a numerical reduction of conventional sternotomy AVR in our centre (octogenarian patients), so that already in 2013 all isolated AVR procedures were performed through a right anterior minithoracotomy in the elderly. It was a conscious option to provide a better service to our patients and to avoid full sternotomy whenever it was possible, because the advantages of a right minithoracotomy were already well known. That is why we deem inappropriate an eventual future study with randomization between full sternotomy and right anterior minithoracotomy in our centre. However, we strongly advocate the hypothesis that minimally invasive AVR could benefit also frail patients versus full sternotomy AVR.

Nobody is perfect, and no article is ideal, even the sun has spots!

We are happy to concede the right of the future study organization to the University Hospital of Asturias!

Conflict of interest: none declared.

References

