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### Does Smoking Confound Risk Factor of Video-Assisted Thoracoscopic Lobectomy 90-Day Mortality?



To the Editor:

We have read with interest the article by Brunelli and colleagues [1], in which it was suggested that male sex, low carbon monoxide lung diffusion capacity (DLCO), and prolonged operative time are risk factors for 90-day death after video-assisted thoracoscopic lobectomy. Point scores were assigned to individual factors; low DLCO and prolonged operative time were assigned one point each, and male sex was assigned three points. Although we agree that male sex and low DLCO are associated with 90-day death after video-assisted thoracoscopic lobectomy, we wonder whether the authors investigated smoking history.

We are of the opinion that smoking history could have influenced the result of the risk factor calculations. Cigarette smoking is a major cause of smoking-related pulmonary diseases such as chronic obstructive pulmonary disease [2], and it is known to affect rates of morbidity and mortality after lung resection [3]. Several studies have also shown that DLCO is reduced in smokers compared with that in nonsmokers and ex-smokers [4, 5]. Furthermore, as the authors mentioned in the discussion, the proportion of male smokers is higher than that of female smokers. Thus, smoking history may be a confounding factor. By investigating the smoking history and re-analyzing the data, the aggregate risk score of male sex may be lowered, or DLCO and male sex may even be excluded from the risk factors. If male sex is still a risk factor when analyzing with smoking history, the biological factors to which the authors refer in the discussion will be further strengthened. Therefore, we would like to know the smoking history, including the number of cigarettes smoked, of the enrolled patients.

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#### Reply

To the Editor:



We thank Dr Kim and colleagues [1] for their interests in our article [2]. As we commented in the original study we agree that smoking may have played a role in the 90-day outcome of patients submitted to video-assisted thoracoscopic lobectomy. Unfortunately, the smoking history was not present in many patients (>20%), and we were not able to include it in the analysis to verify its independent association with outcome.

To satisfy the request of Dr Kim and colleagues we performed the analysis including smoking history by excluding all patients without this variable. This procedure reduced the already small number of events, and this needs to be taken into consideration when interpreting the results. We found that the variable pack-years was not associated with 90-day death and did not change the significant association between male sex and this end point.

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### Functional Mitral Regurgitation Repair: Earlier Is Better



To the Editor:

Kamperidis and colleagues [1] are to be commended for outlining the predictive role of early postoperative left ventricular (LV) forward stroke volume on late outcome after functional mitral regurgitation (MR) repair with a restrictive ring. Baseline transaortic flow has been reported to predict late death and recurrent MR after LV restoration and MR correction [2], reflecting the detrimental effects of backward flow and MR in dilated cardiomyopathy [3, 4]. The authors focused on death and a major morbidity-and-mortality composite end point, rather than relapsing MR, and stated that associations of changes in LV hemodynamics with survival has not been investigated.

However, we reported near-identical outcomes after ischemic MR repair, namely, acute LV reverse remodeling, unchanged ejection fraction, and trivial MR [5]. Besides, we also outlined how ejection fraction, LV end-systolic volume index (ESVI) and

wall motion at discharge predicted different probabilities of late reverse remodeling, whereas early postoperative wall motion and ESVI anticipated death and heart failure, respectively. In other words, the severity of the underlying cardiomyopathy, not only at baseline but also immediately after repair, affects late outcome, and stroke volume only represents an additional surrogate to depict this.

In analogy to our experience, the authors describe MR repair before extreme LV dilatation (mean end-diastolic volume, 188 mL), whereas cause was nonischemic in 78% of the patients, suggesting that MR can be durably cured with earlier repair, irrespective of concurrent revascularization.

Finally, results refer to complete rings and annular restriction by two sizes, confirming the importance of anteroposterior mitral diameter fixation [5]. Despite some degree of diastolic impairment, the predictability of postoperative LV function is a pivotal key to optimize late outcome after functional MR repair, justifying aggressive indications.

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#### Reply

To the Editor:



We thank Drs Pocar and Passolunghi [1] for their interest in our work [2] evaluating the association between left ventricle (LV) forward stroke volume after surgical mitral valve repair for secondary mitral regurgitation and all-cause mortality. Restrictive mitral annuloplasty with complete surgical rings undersized by two sizes has been demonstrated effective in patients with secondary mitral regurgitation and dilated LV. However, significant tethering of the mitral leaflets caused by severe dilation of the LV and displacement of papillary muscles posterior and

apically has been independently associated with increased risk of mitral regurgitation recurrence at follow-up [3]. Accordingly, surgical ventricular restoration or cardiac support devices such as the CorCap (Acorn Cardiovascular, St. Paul, MN) have been proposed as important additional procedures to ensure durable surgical mitral valve repair and improve LV systolic function [4, 5].

Patient selection is crucial to identify the patients who will benefit from surgical mitral valve repair in terms of symptoms, LV remodeling, LV function, and prognosis. Left ventricular ejection fraction, one of the main factors to select patients for surgical mitral valve repair, may not be an accurate reflector of the LV systolic function in this group of patients as it represents a change in total LV volume and does not take into account whether the direction of the blood flow is regurgitant or forward. Mitral valve repair eliminates the volume overload, and as a result, the LV ejection fraction may remain unchanged or even reduced. In contrast, LV forward stroke volume after mitral valve repair provides a better reflector of the true LV systolic function because it is a direct measurement of the volume pumped into the aorta. Our study demonstrated that successful surgical mitral valve repair for secondary mitral regurgitation improved the LV hemodynamics with increased LV forward stroke volume and reduced pulmonary arterial systolic pressure without changes in LV ejection fraction [2]. Whether surgical ventricular restoration could have further improved LV forward stroke volume could not be answered by the present data owing to the limited number of patients undergoing this procedure. Importantly, LV forward stroke volume at discharge was the only hemodynamic variable independently associated with overall survival. How to identify the patients who will have improved LV forward stroke volume after successful mitral valve repair needs to be investigated in additional studies.

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