

## Editorial comment on: “Major morbidity after video-assisted thoracic surgery lung resections: a comparison between the European Society of Thoracic Surgeons definition and the Thoracic Morbidity and Mortality system” by Sandri A, *et al.*

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Submitted Aug 22, 2015. Accepted for publication Aug 31, 2015.

doi: 10.3978/j.issn.2072-1439.2015.09.03

View this article at: <http://dx.doi.org/10.3978/j.issn.2072-1439.2015.09.03>

The current issue of the *Journal of Thoracic Disease* publishes the remarkable work of Sandri and associates (1) which not only contributes to a deeper understanding of the distribution of postoperative complications, but also questions the traditional classification of major complications, in the framework of video-assisted thoracic surgery (VATS) lung resection.

For this purpose, the authors retrospectively reviewed 227 patients submitted to VATS lobectomy for primary lung cancer in their department, over a period of 26 months. Within this cohort, the analysis was performed on those patients who faced at least one postoperative complication. All the identified postoperative complications were classified according to the definitions proposed by the European Society of Thoracic Surgery (ESTS) Database Committee (2) and subsequently graded according to the TM&M classification system (3). The total number of postoperative complications was 34 (15%). Following the ESTS definitions, 20 patients (8.8%) were affected by major cardiopulmonary complications—accounting for 59% of the total complications recorded in this series—of which nine were reclassified as minor complications (grade II) by the TM&M classification system. According to the TM&M classification system, ten patients had minor complications (grades I and II), while 24 patients (11%) developed major complications (including three deaths), accounting for 71% of the total complications recorded in this series. Importantly, when analyzing the postoperative LOS between the patients who remained classified in the

ESTS major complication group after the TM&M recoding and the patients reclassified in the minor complication group according to it, there was a 12-day difference (21.6 vs. 9.6 days;  $P=0.08$ ). Finally, the authors concluded that the distribution of postoperative complications differs between the two classifications systems and proposed to use the TM&M grading system as an additional instrument for risk modeling.

Postoperative complications are often used as primary endpoint for outcomes analysis and are currently considered as indirect indicators of quality of care: quality of surgical treatment given to the patient, hospitalization cost and patient's quality of life following surgery (4,5). However, few studies in the past 10 years have sought to address the very interesting but seldom debated question of risk stratification of postoperative complications in the framework of thoracic surgery, and they have, for the most part, been single institutions series or database reports (3,6-9). This stimulating article helps to clarify some of the controversies in postoperative complications stratification and its main findings may well have a relevant impact on patients' management in the near future. Indeed, the authors clearly explained the difference between the two systems that can help to understand the discrepancy in classification: the ESTS classification system intends to identify a series of frequent and potentially life-threatening complications while the TM&M classification system does not discriminate between the types of complication occurred, but weighs each complication through a grading

system that takes into account the effort required to treat them. In other words, it is of major importance to keep in mind that they are complementary and not opposite!

In addition, one can wonder whether if it is more important to assess that more than half of the complications (55%) considered as major complications according to the ESTS were confirmed so in the TM&M since they required a complex management, or on the contrary emphasized that 45% of them were reclassified as minor complications according to the TM&M classification, since only required a pharmacological treatment and had a minimal impact on patients postoperative course. In my mind, this classical half-full—half-empty glass dilemma is no longer relevant. The current contribution shows an essential way to explore. It becomes important in the current era to create a standardized system capable not only to reliably record but also classified and grade the complications, hence overcoming one of the most important limitations when dealing with morbidity—mortality analysis. Exploring precisely and systematically postoperative outcomes for each single patient—in a standardized way in huge databases—will therefore be the clue to achieve to reliably stratify morbidity—mortality and, going one step further, to shed light on the key role of databases in health economic models. For this purpose, the mission of the ESTS and STS General Thoracic Surgery Database Committee, promoting quality improvement and patient safety, is of major importance.

Where do we go next in the challenging field of risk analysis and stratification following minimally invasive surgical procedures, presently VATS lung surgery? On the one hand, it is well known that an accurate, reproducible and standardized measurement and monitoring of adverse events following surgery serves as a basis for any reliable data collection and analysis; on the other hand, current scientific evidence suggests that treatment-related morbidity and mortality should preferably include all events that occur as a consequence of a procedure, regardless of the time span between the procedure and event. For instance, when dealing with mortality, 90-day mortality (10) or 6-month mortality (11) were used for pneumonectomy after which physiological cardiopulmonary impairment due to surgery can lead to late deaths. Moreover, morbidity and mortality does not sum up safety. Overall risk of complication and failure to rescue (defined as mortality after a complication) are additional outcomes which should also be of interest (12). Finally, safety does not mean quality, even if these two factors are correlatively related.

In the meantime, Doctor Sandri and associates are to be congratulated on their investigations in this area. From the standpoint of medical care, their results will certainly prove to be most beneficial to the thoracic surgery community and affect future patient management.

## Acknowledgements

The author thanks Lindsey Cosbi for her expert editorial review of the manuscript.

## Footnote

*Conflicts of Interest:* The author has no conflicts of interest to declare.

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**Cite this article as:** Falcoz PE. Editorial comment on: "Major morbidity after video-assisted thoracic surgery lung resections: a comparison between the European Society of Thoracic Surgeons definition and the Thoracic Morbidity and Mortality system" by Sandri A, *et al.* *J Thorac Dis* 2015;7(9):E329-E331. doi: 10.3978/j.issn.2072-1439.2015.09.03