



A 90-day mortality risk model as a support in managing patients undergoing video-assisted thoracic surgery for lung cancer

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The introduction of the video-assisted thoracoscopic (VATS) approach for lung lobectomy in the treatment of lung cancer has led to a reduction of postoperative morbidity, length of stay and, in some studies, of mortality when compared to thoracotomy (1-3). The improvement of postoperative outcomes as a consequence of this minimally-invasive approach, which minimize tissue injury and immune-stress response, has allowed a rapid diffusion of this technique that is currently preferred to thoracotomy approach in several experienced centers. Thus, it is crucial to know the incidence of postoperative complications and deaths after VATS resection of lung cancer in order to better counsel the increasing number of patients that are going to facing this surgical procedure.

However, while there are plentiful data about postoperative morbidity and in-hospital/30-day mortality after VATS lung resection, paucity of information is reported about long term (90-day) mortality. Moreover, according to recent reports, which refer to patients undergoing resection for lung cancer without specifying the surgical approach, mortality seems to double at 90 days when compared with that one observed at 30 days after surgery, suggesting a closed monitoring of the patients until three months after surgery (4,5).

In a recent paper, Brunelli *et al.* put the light on this issue and showed that 30-day mortality and 90-day mortality after 733 VATS lobectomies or segmentectomies performed for clinical stage I-II lung cancer were similar, 1.9% and 2.5% respectively (6). Moreover, the authors proposed a five classes' 90-day mortality risk score model including the

following factors, identified to be independently associated to 90-day mortality: male sex, carbon monoxide lung diffusion lower than 60% and operative time longer than 150 minutes (6).

The study results are relevant first of all because they analysed and compared 30- vs. 90-day mortality in a large cohort of patients undergoing lung resection for lung cancer with VATS approach demonstrating that for VATS lobectomies and segmentectomies mortality does not significantly increase at 90 days after surgery (6). Since now, the data analysing the trend of postoperative mortality between the 30th and the 90th day after lung resection for lung cancer referred to a population with no specified surgical approach, leaving this issued unsolved for patients undergoing VATS lobectomy (4,5,7,8).

Secondly, proposed the 90-day mortality risk score may be a useful support for clinicians in lung cancer patients' tailored management and counselling.

During multidisciplinary meeting discussion, the possibility to accurately predict patients' mortality risk after VATS lung resection may help clinicians in the decision making process; consequently a most appropriate treatment may be proposed to high-risk patients, who could probably benefit more from non-surgical treatment.

Moreover, basing on this simple three risk factors model, during patients' counselling, the surgeons could give patients more realistic data about the mortality risk rate related to the surgical procedure. To impact on the modifiable risk factor, surgeons could also discuss the possibility to convert to an open approach in order to limit

the duration of surgery, mainly if the patients are men with carbon monoxide lung diffusion lower than 60%.

In the age of mini-invasive surgery it is fundamental to know VATS specific data related not only to surgical morbidity but also to surgical mortality. Furthermore, including these data into a 90-day mortality risk model may be the first step in supporting surgeons in managing lung cancer patients' treatment and counselling. Finally, an external validation of this innovative model is required before its clinical application.

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