


Validation of a prognostic model to predict survival after non-small-cell lung cancer surgery

Few studies in the past 10 years have sought to address the fundamental question of prognostic survival model after non-small-cell lung cancer (NSCLC) surgery. Indeed, very little is known to date about adequately predicting survival with relevant pre- or postoperative parameters. The decision to perform an operative procedure requires careful assessment of the potential risks and benefits involved, particularly in terms of survival. Risk is usually assessed by applying knowledge both from published sources — surgical series in the literature and registry data — and from the personal experience — clinical acuity — of the physicians who will perform the procedure. A number of biases, however, may contribute to the difficulty of predicting the likelihood of an event [1]. It is now well known that quantitative methods that discriminate factors associated with survival and the integration of this information by predictive models of clinical rules [2] are beneficial both to physicians and to their patients.

The current issue of the European Journal of Cardio-thoracic Surgery publishes the remarkable work of the Erasmus University team concerning the validation of a prognostic model (with a preoperative and a postoperative mode) to predict survival [3], on a cohort of patients operated on for primary NSCLC. In the present article, the authors add to their previous contribution [4] by investigating the evaluation of the performance — assessed in terms of both discrimination (resolution) and calibration (reliability) of a prognostic model of survival. In a cohort of 126 patients, the results showed that the discriminative ability of the best model — postoperative — varies from 0.72 to 0.77 and that calibration was adequate for the first 2 years but poor for 3-year survival. Finally, they concluded that the model adequately estimates 1- and 2-year survival and that discrimination was good for 3-year survival.

Why should thoracic surgeons be concerned with prognostic models or interested in this rigorous study? Not only have prognostic models of survival after lung cancer surgery seldom been reported, but this stimulating article also raises a very crucial question from the standpoint of medical care and billing in that it identifies a subpopulation of patients who would benefit — or not — from a given operation. In other words, unnecessary surgery may be avoided. This prognostic model of survival could be used prospectively to inform and advise patients regarding postoperative survival and retrospectively to enable fair comparisons of outcomes (postoperative advance care management planning, performance comparisons stratified by risk groups). It would also be useful both for calculating the survival of an individual patient and for contrasting expected and observed mortalities for an institution or an independent clinician. Herein lies the merit and the strength of the current article, which advocates the possibility of multiple comparisons — an increasingly dominant concept in the medical community.
Where do we go next in the burgeoning field of prognostic models in medicine? The widespread availability of new computational methods and tools for data analysis and predictive modelling requires medical informatic researchers and practitioners to systematically select the most appropriate strategy to cope with clinical prediction issues. There are many different ways in which prognostic models can be developed and used [5], including guiding health-care policy, assisting comparative audits among hospitals, cost-reimbursement programmes and selecting appropriate treatment in individual patient management; the last includes decision making to carry out treatment or not. In addition, various methods have been suggested for the representation of prognostic models ranging from quantitative and probabilistic approaches to symbolic and qualitative ones. Among them, the method known as ‘data mining’ has become an essential instrument for medical researchers and clinical practitioners [6]. It offers methodological and technical solutions to deal specifically with the analysis of medical data (e.g., pre- and/or postoperative) and construction of prediction survival models. Thanks to the integration of molecular and clinical data, along with genomic medicine, the prognostic model has taken an important step. In the near future, the use of ‘data mining’ may be the clue to not only refine prognosis and predict survival more accurately, but also alter the established decision of therapeutic indications.

In the meantime, Dr Van der Pijl and associates are to be congratulated on persevering in 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.

References


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