Reviewer's report

Title: A Prospective Cohort Study of Postoperative Complications in the Management of Perforated Peptic Ulcer

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Reviewer: Marek Brabec

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General
Motivation for the presented study is clearly stated and has substantial practical consequences. As authors state in the Background, predictors for morbidity and for mortality might be potentially different and hence those traditional strategies oriented to mortality stratification might not be the best when mortality was (fortunately) lowered and morbidity comes into focus.
Methodologically, the search for a set of good predictors is not entirely easy, nor completely straightforward. The present paper tries to use very standard statistical methodology. Even though various improvements over this textbook approach are known, the standard contribution might be useful when presented in appropriate framework, discussed perhaps with a bit of skepticism and mainly in a rigorous way. Especially lack of rigor is what is missing in the paper. Even terminology can be improved a lot to prevent misunderstanding and even misleading conclusions.

Typical example of terminological carelessness is repeated use of the notion of multivariate models through the text. The techniques that the authors use are all UNIVARIATE. Note that in Statistics (both theory and applications), regression with several explanatory variables is a univariate method and it is called multiple regression, not multivariate. There are multivariate generalizations of regression, logistic regression, etc. but they are more complicated (work with several dependent variables at once) and were not used by the authors of this paper at all. True multivariate techniques might be useful in present context (e.g. when considering simultaneous behavior of several complication events), instead of lumping them into more or less artificial composite index dubbed in the paper as postoperative complication (note that complications having various causes and consequences are lumped together in the apples and oranges style, so that usefulness of such a measure is a bit questionable from practical point of view). In any case, statistical models used for the analyses should be clearly stated within the text (as equations showing clearly what is predicted from what). Estimated coefficients should be presented not only in sometimes hard to read graphs, but also in tabular form, point estimates should be accompanied by some quantity expressing uncertainty (e.g. standard errors, confidence intervals, etc.).

Another question of practical interest is generalizability of the results. For instance, the authors stated that the study was conducted in two particular hospitals. Can the spectrum of complications (and their relative frequencies) be expected similar at different places? And are the predictors and their importance similar at different places? These are obviously questions that are hard to answer without further studies, but their relevance should be at least acknowledged in the discussion. Moreover, the fact that the data are available from two locations can be used to perform statistical tests comparing: i) spectrum of complications, ii) predictors between the locations. Obviously, apparent homogeneity between them is only necessary, but not sufficient condition for further generalizability, but it should be tried as the first attempt. Note that there are many subtleties that can be elegantly studied by means of statistical analysis, e.g. whether the prediction models are about the same for different locations, whether coefficients of the same explanatory variables are similar at different locations, etc.

Discrepancy between analyses with single explanatory variable and with several explanatory variables taken simultaneously (e.g. that mentioned on page 12) is taken quite lightly, it is not investigated, nor discussed (note that it is by no means automatic that the simultaneous analysis is free of problems remember troubles with collinearity and many others).

The way of writing results is too compact sometimes. notation is terrible. It would not take too much space to state every time that OR was such and such and p was such and such, while such provision would enhance readability substantially. notation should be replaced by . etc. It is really hard to swallow inherently contradictory statements like independently predicted and that appear within the text. Probably, just the usual predicted by the explanatory variables is meant but the meaning is masked so that it is hard to decipher. Some variables entering the analyses are not defined previously. For instance, take suggestive of shock. What does it mean precisely? How long history, how was the datum about it obtained questionaire/questioning by a particular investigator/taken from routine documentation, etc.? Graph legend should be much more extensive. For instance, it is not explained what is the meaning of the
numbers in Figure 2F (probably p-values, but one has to guess).

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

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Discretionary Revisions (which the author can choose to ignore)