

Is Severity of Disease More Important Than Choice of Surgical Treatment in Secondary Peritonitis?

To the Editor: We read the article by Rakić et al (1) with great interest. They investigated if the mortality and morbidity of patients with diffuse secondary peritonitis might be reduced by leaving the abdomen open after the initial laparotomy or subsequent relaparotomies. Sixty-five patients treated in two different hospitals were operated by either on-demand reoperation or planned relaparotomy via laparostomy, and the mortality was higher among patients treated by on-demand relaparotomy. However, after the adjustment for sex and Acute Physiology and Chronic Health Evaluation (APACHE) II score, there was no significant difference in the relative risk of dying between these two patient groups. The authors concluded that the disease severity in the secondary peritonitis was more important for survival than the choice of surgical approach. Nevertheless, methodological shortcomings in the study design and interpretation of data prohibit generalization of the study conclusions.

Relatively small group size of non-randomization of patients in the trial by Rakić et al (1) harbor a high risk of random-high or random-low effects on the results. The non-stratified and non-random-

ized groups were clearly not comparable with respect to the severity of disease. The conclusions could furthermore be explained by what the authors called "natural randomization." This enhanced the non-comparability between the groups, as the relaparotomies were performed in two different hospitals, by different surgeons, and in different clinical circumstances. Methodologically, any result could have been obtained, be it in favor of on-demand surgery or planned relaparotomy, or even both being equally effective. It would have been more correct if a study with a higher level of evidence was performed, eg, a prospective, randomized controlled trial comparing the planned and on-demand approach in secondary peritonitis.

A meta-analysis of observational studies comparing the planned relaparotomy and the on-demand relaparotomy found a non-significant reduction in mortality (odds ratio, 0.70; 95% confidence interval, 0.27-1.80) (2). A retrospective analysis of 278 patients with secondary peritonitis found a significantly lower mortality in patients in the on-demand relaparotomy group than in patients in the planned relaparotomy group (3).

Furthermore, morbidity was understated in the trial by Rakić et al (1). The planned relaparotomy strategy, especially when combined with a laparotomy technique, is often considered to carry an increased risk of complications, such as inci-

sional hernia. Patient might have survived the septic episode of secondary peritonitis, but had to undergo surgery for abdominal wall closure later on. Our analysis of patients with secondary peritonitis showed that significantly more patients in the planned relaparotomy group had an incisional hernia in comparison with patients operated on demand (3).

Rakić et al (1) did not mention any non-invasive percutaneous procedures for intra-abdominal abscesses performed in on-demand relaparotomy.

The APACHE II score has not been validated to be used in a sequential manner, as it was done by Rakić et al (1). It has been shown that sequential APACHE II scores reveal continuous improvement of APACHE II scores in survivors, but have no therapeutic relevance to the decision on management of individual patients (4).

In conclusion, the dilemma whether to perform a planned relaparotomy or a relaparotomy on demand in patients with secondary peritonitis will remain a matter of debate until more conclusive results from randomized trials become available. In non-randomized trials, the shortcomings may be reduced by including a large number of patients, analysis of all possible and plausible confounders, and display of detailed data on such variables and morbidity outcome parameters in publications. Although studies in this clinical problem are

encouraged, the results and conclusion of trials with methodological limitations such as this one should be interpreted with caution.

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In Reply: There is no clear recommendation on how to treat patients with severe intra-abdominal infection, such as tertiary peritonitis with polymicrobial sepsis. According to our estimate, a hospital with 100 surgical beds admits <10 such patients a year. Therefore, we found it very difficult to run a prospective randomized trial with larger number of patients. Given this limitation, we suggest that a multinational randomized study be performed as it would facilitate inclusion of a larger number of patients.

Our view was that the best results could be obtained if adequate source control existed. In our experience, a single laparotomy is not often sufficient to achieve this goal. On the other hand, on-demand laparotomy is often performed too late in case of severe intra-abdominal infections. In our series, re-ex-

- 1 Rakic M, Popovic D, Rakic M, Druzijanic N, Lojpur M, Hall BA, et al. Comparison of on-demand vs planned relaparotomy for treatment of severe intra-abdominal infections. *Croat Med J*. 2005;46:957-63. [Medline:16342350](#)
- 2 Lamme B, Boermeester MA, Reitsma JB, Mahler CW, Obertop H, Gouma DJ. Meta-analysis of relaparotomy for secondary peritonitis. *Br J Surg*. 2002;89:1516-24. [Medline:12445059](#)
- 3 Lamme B, Boermeester MA, Belt EJ,

van Till JW, Gouma DJ, Obertop H. Mortality and morbidity of planned relaparotomy versus relaparotomy on demand for secondary peritonitis. *Br J Surg*. 2004;91:1046-54. [Medline:15286969](#)

- 4 Koperna T, Semmler D, Marian F. Risk stratification in emergency surgical patients: is the APACHE II score a reliable marker of physiological impairment? *Arch Surg*. 2001;136:55-9. [Medline:11146778](#)

plorations more than 48 hours after the initial operation resulted in higher mortality compared with re-explorations performed within 48 hours (77% vs 28%, respectively).

We have performed special type of semi-open laparostomy protected with sutureless plastic sheet (we also video-recorded the procedure). In our experience, this type of management of semi-open abdomen resulted in reduced postoperative complications, such as intestinal prolapse or abdominal wall damage, reducing the risk of postoperative hernia.

We believe that non-invasive percutaneous procedure in severe intra-abdominal infections with diffuse peritonitis is not an ideal option and prefer to use it in patients with localized peritonitis. Thus, such patients were excluded from the study. We also think that

APACHE II score are very useful predictor of severity of intra-abdominal infection as well as therapeutic adequacy, comparable to Mannheim Peritonitis Index (1).

There are of course lots of important issues connected to questions when to treat patients with open approach, how often to re-explore and when to close it. These very important questions are yet to be discussed and we are looking forward to work together with you and other colleges in order to have better results.

We thank you for your valuable comments and appreciate the opportunity to discuss our findings.

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- 1 Ohmann C, Hau T. Prognostic indices in peritonitis. *Hepatogastroenterology*. 1997;44:937-46. [Medline:9261581](#)