



Authors' Reply: Perforated Diverticulitis with Generalized Peritonitis: Low Stoma Rate Using a “Damage Control Strategy”

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Dear Editor,

We highly appreciate comments by Mattone and his coworkers. In this context, we totally agree about certain limitations of our study.

Within our first analysis, we compared 19 patients after the use of a damage control strategy (DCS) with a control group, consisting of 18 patients (Hartmann's procedure: $n = 14$, primary anastomosis: $n = 4$). Both groups were equally weighted in terms of demographics, severity of peritonitis, and comorbidities. The overall postoperative mortality was 11% ($n = 4$). Postoperative morbidity and mortality were without statistically significant difference between both groups; however, a significantly higher proportion of patients in the control group had a stoma after the initial hospital stay (83 vs. 47%, $p = 0.038$) [1]. These favorable results led to a routine application of DCS in patients, hospitalized for perforated diverticular disease with generalized peritonitis. Indeed, the individual clinical condition was not involved into the decision process. However, the intraoperative finding of a generalized purulent or feculent peritonitis was indicative for the use of

DCS. All patients with localized peritonitis were excluded from the analysis. Therefore, patients were selected for the parameter generalized versus localized peritonitis.

After having shown the above-mentioned advantages within our earlier analysis, the focused study was constructed as a proof of concept within a multicentric setting. DCS was a standard treatment from 2014 in all associated centers and therefore the only technique, applied in case of generalized peritonitis within the study period. In this context, no adequate control group was available for the respective time frame. This fact is indeed potentially biasing and must be overcome by a randomized controlled trial (RCT) in future.

Absolutely, primary anastomosis consequently needs to be considered as a potential option. By now, three randomized trials compare sigmoidectomy with primary anastomosis (PRA) to Hartmann's procedure (HP) for the emergency management of Hinchey III and IV stages [2–5]. Therein, *all* patients received diverting ileostomy in addition to colorectal anastomosis. Thus, a stoma rate of 100% results after the initial hospital stay. To date, no prospective data exist for PRA without diverting ileostomy in this setting. Consequently, the comparably low stoma rate of 50% using the damage control strategy must be pointed out as a main advantage of the presented technique.

According to our experience, the multitude of patients, who undergo emergency surgery for the above-mentioned reasons, are treated beyond daytime schedule and commonly not by experienced colorectal surgeons. Therein, complex surgical procedures, such as sigmoidectomy with primary anastomosis, remain difficult to apply. After limited resection and intensive care-based therapy for 2 days, 83% of the included patients were fitted for secondary colorectal anastomosis in our cohort. In this context, use of a DCS can improve the selection of patients for definite reconstruction relevantly.

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We agree to advantages of Hartmann's procedure (HP), highlighted by Mattone and coworkers. However, the technique has a significant negative impact on patients' well-being. The overall reversal rate is only about 50%, which can be considered extremely low, especially in benign disease [5, 6]. Moreover, stoma quality is commonly low, resulting from emergency procedures. This relevantly affects patients' quality of life in the long term. Therefore, alternate techniques such as DCS are favorable in our opinion, if safety and efficacy are comparable to HP.

In conclusion, comparable to HP, the damage control strategy combines all requirements for an emergency operation: short duration, effective elimination of the septic focus, and safety. Advantages of the method are a better patient selection for definite reconstruction at second operation and a comparably low stoma rate of approximately 50%. Moreover, the limited emergency procedure can easily be performed by a general surgeon without colorectal specialization. To date, DCS could not be estimated as "the Golden standard" but should be evaluated as an effective and safe alternative to HP.

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