



# Reply to: does utilization of laparoscopy improve successful adherence to enhanced recovery programs in colorectal surgery?

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Fast-track surgery has been initially applied in patients undergoing open colorectal resection (1) and minimally invasive surgery was not included in the multimodal enhanced recovery after surgery (ERAS) pathway (2). Laparoscopic surgery (LPS) was associated with a shorter length of hospital stay than open surgery even when postoperative morbidity was similar (3). The common practice suggests that patients who underwent LPS quickly recover oral feeding, mobilization, and self-care ability. Therefore, it seems reasonable to combine a minimally invasive surgical technique and a stress-reducing perioperative pathway. Previous randomized studies, systematic reviews and meta-analyses reported better postoperative outcomes when LPS and ERAS protocols were associated (4-6).

Our multicenter study reported that minimally invasive surgery enhanced postoperative adherence to ERAS protocol (7). In fact, oral feeding and stop of intravenous fluids occurred later in the open surgery group. The same results were found using the intent-to-treat analysis (patients with conversion to open surgery remained in the LPS group) and the per-protocol analysis (converted patients were added to the open group). When the analysis was limited to patients with uneventful postoperative course, only 10% were not compliant to the enhanced recovery protocol in the LPS group compared to 39% in the open group.

In our series, patients who underwent open surgery were older, however the ASA score distribution was similar in both groups. Epidural analgesia was less used in the

LPS group according to recent ERAS guidelines which strongly suggested epidural analgesia in open surgery, while its indication in minimally invasive surgery was weak (8). Multivariate regression analysis showed that LPS had an independent contribution to enhance postoperative adherence to ERAS protocol and to shorten time to readiness for discharge, while older age and epidural did not. Our previous study showed that within an ERAS pathway and stratifying patients according to the ASA score, elderly patients had only 1-day longer hospital stay than younger (9).

The mean length of hospital stay was longer and readmission rate was lower when compared to the first experiences of fast track in patients undergoing colorectal surgery (10). This could reflect a more careful discharge policy because home care quality is suboptimal in Italy and patients usually completed postoperative recovery in hospital.

All participating hospitals were invited to include consecutive patients undergoing elective colorectal surgery, however a potential selection bias cannot be ruled out. The wide range of patients' age and comorbidity would reflect a small likelihood of selectivity. We did not find a substantial difference in the rate of patients who underwent LPS among the hospitals involved in the study. Regardless of type of surgery, all patients were managed according to the comprehensive ERAS<sup>®</sup> Society protocol. Before starting the study, all hospitals identified a multidisciplinary team and were involved in an ERAS implementation program including audit meetings.

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