Short Communication

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Once upon a Time ERAS Principles and Future Perspectives in Emergency Surgery

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ABSTRACT

Enhanced Recovery After Surgery (ERAS) is multimodal care approach that has revolutionized clinical practice in the field of elective Colo-rectal surgery; thanks to the scientific evidence acquired, ERAS has become standard approach for elective Colo-rectal cancer. As regards the application of an ERAS program in emergency Colo-rectal surgery, the available literature is still poor, and the few data available derive from studies of moderate quality. The first available data of literature suggest the safety, feasibility, and benefits of applying a modified ERAS protocol in abdominal Colo-rectal and small bowel surgery in emergency regime. In fact, the adoption of a modified ERAS program is associated with a lower incidence of complications and reduction in post-operative hospitalization without increasing the risk of readmission or re-operation and mortality at 30 days. Our ERAS team of the Santa Maria Annunziata Hospital in Florence, Italy, has drawn up the ERASMUS protocol, an ERAS original emergency protocol. The study is currently underway More evidence is needed to establish the benefits, but certainly emergency surgery appears to be a stimulating field of future application of ERAS protocols.

INTRODUCTION

Enhanced Recovery After Surgery (ERAS) is the patient-centered, multimodal care approach that has revolutionized clinical practice in the field of elective colo-rectal surgery. Almost twenty-five years ago, Henrik Kehlet had sensed that the multidisciplinary approach to the patient candidate for major surgery could lead to an improvement in surgical results in terms of functional recovery, reduction of morbidity and post-operative hospitalization and suggested to reorganize the entire traditional peri-operative course [1]. Taking up the insights that Cuthbertson already had seventy years earlier [2], Kehlet highlighted the negative impact of catabolic stress on post-surgical outcome and argued that early rehabilitation could strongly affect the reduction of this stress, especially in elderly patients [1].

In the following years, the ERAS philosophy was developed in the various surgical branches and, thanks to scientific evidence, led to the establishment of the ERAS Society and the spread of the guidelines for elective colo-rectal surgery. In the wake of the spread of ERAS in Europe and the United States, the Perioperative Italian Society (POIS) was recently established in Italy, which contributed to the dissemination of the protocol and the knowledge of it's principles.

The spread of the laparoscopic technique has brought out the role of minimally invasive surgery in improving the post-operative outcome. In 2011 the LAFA-Study [3] confirmed that for elective colon-cancer surgery the optimal treatment is laparoscopic colon resection within a Fast-track program; this combination guarantees the best surgical outcome in terms of morbidity, mortality, reduction of major complications within 30 days and post-operative hospitalization compared to the Open / Fast-Track surgery, Laparoscopy / Standard Care, Open / Standard Care surgery. The LAFA-study also highlighted that, if there is a need for conversion, it is preferable to include the patient in an ERAS path rather than in "Standard care". In recent years, it has also emerged that adherence to the protocol could be associated with a possible benefit on "disease free-survival" and "overall survival" in patients with respectable Colo-rectal cancer [4]. Thanks to the

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scientific evidence acquired, ERAS has become standard approach for elective Colo-rectal cancer.

As regards the application of an ERAS program in emergency Colo-rectal surgery, the available literature is still poor, and the few data available derive from studies of moderate quality, usually case-control studies where the application of a modified ERAS protocol for emergency is compared to the outcomes of patients in the PRE-ERAS period. The scarcity of data is due to the difficulty of applying a standardized protocol to such a heterogeneous group of patients as the one undergoing emergency surgical procedures, as well as to the precariousness and instability of these patients.

On the other hand, in multidisciplinary teams in which an ERAS protocol is applied in an elective regime and in which the staff is trained and confident with the elements of the program, it is natural to apply the principles of Fast-track also to patients who underwent emergency surgery although minimally modified.

The first publication dates back to 2014 with a case-control study by Lohsiriwat et al. [5] on 20 ERAS patients *vs* 40 PRE-ERAS patients who underwent emergency colectomies or proctocolectomies for stenosing colorectal cancer; subsequently, first Wisely et al. [6] and then Shida et al. [7] published works on the comparison, respectively, of 80 PRE-ERAS *vs* 97 ERAS patients undergoing open respective and non-respective surgery of the colorectal and small intestine and 42 PRE-ERAS patients *vs* 80 ERAS patients who underwent surgery for obstructive colorectal cancer. The latest work, published by Shang in 2018, is a multicenter study with the enrollment of 318 ERAS patients compared retrospectively with 318 PRE-ERAS patients who underwent surgery for obstructive colorectal cancer.

The first available data of literature suggest the safety, feasibility, and benefits of applying a modified ERAS protocol in abdominal Colo-rectal and small bowel surgery in emergency regime. In fact, the adoption of a modified ERAS program is associated with a lower incidence of complications and reduction in post-operative hospitalization without increasing the risk of readmission or re-operation and mortality at 30 days [5-7].

Our ERAS team of the Santa Maria Annunziata Hospital in Florence, Italy, composed by surgeons, anesthetists, and nurses, has drawn up the ERASMUS protocol, an ERAS original emergency protocol, adapting each single item on the basis of the available bibliography and clinical experience. The protocol was disclosed and shared with all surgical staff and with the nursing staff of the Department of Emergency Surgery and the operating room. To simplify data recording, a brochure of the ERAS path has been attached to the medical record, which accompanies the patient throughout the hospital stay. The study is currently underway and we are processing the first available data. The major critical issues in conducting a study on ERAS in emergency colorectal surgery are represented by compliance and adherence to the protocol. This finding is to be correlated with the great variability of emergency operated patients (in terms of comorbidities, type of intervention and precarious clinical conditions), and partly due to the hostility of some of the staff, less confident with ERAS; this distrust is more evident in the older staff, still tied to some past beliefs. The adequate training of the staff, the sharing of the path and the periodic audits are mandatory for the removal of these cultural barriers. On the other hand, some items are necessarily respected in all cases, such as non-mechanical bowel preparation.

More evidence is needed to establish the benefits and to understand which of the items applied to elective surgery have an effective positive impact also on the outcomes of patients undergoing emergency procedures. We still need to verify furthermore the applicability and safety to adapt ERAS principles to patients undergoing emergency surgical procedures, but certainly emergency surgery appears to be a stimulating field of future application of ERAS protocols.

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