



Early enforced mobilisation following surgery for gastrointestinal cancer: feasibility and outcomes

M. van der Leeden^{a,b,*}, R. Huijsmans^a, E. Geleijn^a, E.S.M. de Lange-de Klerk^c,
J. Dekker^{a,d}, H.J. Bonjer^e, D.L. van der Peet^e

^a Department of Rehabilitation Medicine, VU University Medical Centre, Amsterdam, The Netherlands

^b Amsterdam Rehabilitation Research Centre/Reade, Amsterdam, The Netherlands

^c Department of Epidemiology and Biostatistics, VU University Medical Centre, Amsterdam, The Netherlands

^d Department of Psychiatry, VU University Medical Centre, Amsterdam, The Netherlands

^e Department of Surgery, VU University Medical Centre, Amsterdam, The Netherlands

Abstract

Objectives To evaluate the feasibility and outcomes of early enforced mobilisation following surgery for gastrointestinal cancer.

Design Feasibility study with a separate-sample pre–post-test design.

Setting Surgical gastrointestinal ward.

Participants Patients with various types of gastrointestinal cancer, before and after implementation of postoperative enforced mobilisation ($n = 55$ and $n = 61$, respectively).

Intervention The enforced mobilisation protocol included structured mobilisation by a nurse and walking supervised by a physiotherapist, starting within 24 hours of surgery.

Main outcome measures The enforced mobilisation protocol was deemed to be feasible if at least 50% of patients were able to walk the scheduled distance on postoperative day 1. Pre- and postimplementation differences in postoperative pulmonary complications (PPCs), length of hospital stay (LOS) and re-admission rate were analysed using regression analyses, adjusting for relevant co-variables.

Results In the various surgical groups, between 48% and 56% of patients were able to walk the scheduled distance on postoperative day 1, which was regarded as feasible. However, none of the patients who had undergone oesophageal resection were able to walk on postoperative day 1. Excluding these patients from the analyses, a significant decrease in PPCs was found (odds ratio 0.08, 95% confidence interval 0.010 to 0.71, $P = 0.023$) following implementation of enforced mobilisation. Differences in LOS and re-admission rate were not significant.

Conclusions Early enforced mobilisation seems to be feasible in patients following surgery for gastrointestinal cancer, except for those undergoing oesophageal resection. The occurrence of PPCs was reduced after implementation of enforced mobilisation. Further research is needed to confirm these results.

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Keywords: Postoperative mobilisation; Gastrointestinal cancer; Surgery; Outcome; Postoperative pulmonary complications; Length of hospital stay

Introduction

Enhanced recovery after surgery (ERAS) programmes are multimodal programmes that aim to decrease postoperative complications and enable faster recovery of the patient. The main principles of ERAS programmes are patient education; optimising organ function before surgery; minimising

* Corresponding author. Address: Reade, Dr. Jan van Breemenstraat 2, PO Box 58271, 1040 HG Amsterdam, The Netherlands. Tel.: +31 205896291; fax: +31 205896316.

E-mail address: m.vd.leeden@reade.nl (M. van der Leeden).

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invasive surgery; and optimising pain control, gastrointestinal function and early mobilisation after surgery [1]. Following colorectal surgery, ERAS programmes reduce postoperative complication rates and length of hospital stay (LOS) without increasing the risk of re-admission or mortality [2,3].

Despite these positive results, the implementation of ERAS programmes in clinical practice has been found to be difficult [4–6]. This may be due to the profound, radical and numerous changes that surgeons and anaesthetists, but also nurses and other hospital staff, should perform to apply the full suggested programme [7]. At the VU University Medical Centre, Amsterdam, The Netherlands, patients with various types of gastrointestinal cancer (colorectal, liver, oesophageal, stomach, abdominal metastases) are admitted to the same surgical gastrointestinal ward. Although it has been suggested that ERAS programmes may be suitable for other surgical groups as well as colorectal surgery [8–10], implementation is even more difficult as different ERAS protocols are needed in the same ward for various surgical groups. However, elements of ERAS protocols can be applied to all patients undergoing surgery for gastrointestinal cancer, such as optimal pain control, minimally invasive operations and early postoperative mobilisation. Moreover, there are suggestions that implementing one element at a time may lead to better application in clinical practice [7], and that individual elements of an ERAS programme may also have positive effects on postoperative complications and LOS [2,11].

As part of a broader ERAS implementation plan, an early postoperative enforced mobilisation protocol was implemented in the surgical gastrointestinal ward of VU University Medical Centre. The protocol included structured mobilisation by a nurse and walking under the supervision of a physiotherapist, starting within 24 hours of surgery. The protocol is based on literature describing enforced mobilisation within ERAS programmes [6,12,13] and expertise of the hospital staff involved (i.e. surgeons, anaesthetists, nurses and physiotherapists). The protocol is supported by the evidence-based consensus review of the ERAS group [11], which recommends that a prescheduled care plan should be made to mobilise the patient. However, the feasibility of early postoperative enforced mobilisation on a ward with a heterogeneous group of patients with various types of gastrointestinal cancer is unknown.

Several studies have reported that mobilisation within 24 hours of colon surgery was an independent predictor of shorter LOS [14–16]. To the best of the authors' knowledge, there is no direct evidence for the effectiveness of early enforced mobilisation, as a separate element of an ERAS programme, on important outcomes such as postoperative pulmonary complications (PPCs) and LOS. Information about the exact value of each separate intervention is needed for further optimisation of ERAS programmes [2].

Therefore, this feasibility study has two aims: to evaluate the feasibility of early postoperative enforced mobilisation in a group of patients with various types of gastrointestinal

cancer undergoing surgery; and to evaluate the outcomes of early postoperative enforced mobilisation by comparing the occurrence of PPCs, LOS and re-admission rate before and after implementation.

Methods

Design

A feasibility study with a separate-sample pre–post-test design was performed. Data were collected prospectively in two time periods. From November 2010 to the end of January 2011, postoperative outcomes from patients with gastrointestinal cancer who underwent surgery and received traditional postoperative care (without enforced mobilisation) were collected. Subsequently, an early postoperative mobilisation protocol with enforced walking was implemented, and postoperative outcomes of patients were collected from mid February 2011 to the end of April 2011. The study was approved by the Medical Ethics Committee of VU University Medical Centre (reference number 10/360). All participants provided written informed consent.

Patients

Consecutive patients aged >18 years who underwent elective surgery for gastrointestinal cancer at VU University Medical Centre were included in this study. Patients who did not give their informed consent, and patients who were severely deconditioned pre-operatively, thus hindering their ability to perform measurements and mobilisation (according to the treating surgeon), were excluded from the study. Patients were informed about this study when their surgery was planned. They were asked to participate in the study on the day of admission.

Surgical treatment

All operations were performed by the same team of surgeons, using similar operative and peri-operative procedures in both time periods. The ERAS elements that had already been implemented successfully on the Gastrointestinal Oncology Ward of VU University Medical Centre included the optimisation of pain control by epidural analgesia and non-opioid multimodal analgesia, the use of minimally invasive operations and early enteral feeding.

Postoperative mobilisation

Traditional mobilisation

Traditional postoperative mobilisation, as performed in the first period of the study, was delivered by the nursing staff and included stimulation of the patient to get out of bed. On the first day after surgery, patients were instructed to sit in

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