



## Research Paper

# Conventional versus fast track anaesthesia in an unselected group of patients undergoing revisional bariatric surgery

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## ARTICLE INFO

## Article history:

Received 18 December 2015  
Received in revised form 16 February 2016  
Accepted 20 February 2016  
Available online 2 March 2016

## Keywords:

Revisional bariatric surgery  
Fast track anaesthesia

## ABSTRACT

**Introduction:** Fast track care has proven to be safe and effective in primary bariatric procedures. The number of more complex revisional procedures is expected to rise over the next years. The aim was to evaluate the potential benefits and safety of a fast-track protocol in an unselected group of patients undergoing Roux-en-Y Gastric Bypass (rRYGBP) as revision.

**Method:** For this retrospective study, all patients undergoing rRYGBP between January 2005 and December 2013 were included and categorized between conventional care (CC) and fast track care (FT). Patient characteristics, operative details and intra- and early postoperative complications < 30 days were analysed.

**Results:** A total of 407 patients were included for analysis. 303 patients (74.4%) received peri- and postoperative treatment according to the fast track protocol. Mean age of the study population was  $44.0 \pm 8.9$  years; mean pre-primary procedure BMI was  $45.7 \pm 7.0$  kg/m<sup>2</sup>. A total of 54 (13.3%) postoperative complications were registered (CC 19.2% vs FT 11.2%;  $p = 0.038$ ). Both operative time (CC  $135.3 \pm 42.6$  minutes vs FT  $79.3 \pm 29.3$  minutes;  $p < 0.001$ ) as well as hospital stay (CC  $5.1 \pm 6.3$  days vs FT  $3.1 \pm 5.3$  days;  $p < 0.001$ ) were significantly shorter in the FT group. A multivariate analysis on postoperative complications showed that fast track was not predictive for the occurrence of complications (OR = 0.853; 95% CI [0.403–1.804];  $p = 0.677$ ).

**Conclusion:** Fast track care appears to be safe and efficient for patients undergoing revisional Roux-en-Y gastric bypass, but postoperative outcome may be highly dependent on surgical experience.

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## 1. Introduction

Over the last years, a high number of bariatric procedures have been performed worldwide [1]. Therefore, it is expected that the number of revisions will increase over the next years. High revision rates up to 50% are found after either adjustable gastric banding (AGB) or vertical banded gastroplasty (VGB). Reported revision rates after sleeve gastrectomy (SG) are lower, keeping in mind that proper long-term follow-up after SG is scarce [2–7]. A frequently

performed revision for these failed restrictive bariatric procedures is conversion to Roux-en-Y gastric bypass (RYGBP) [5,6,8]. In the early days of bariatric surgery, revisions were questioned for their safety and additional benefit [9]. Nowadays, for a specific group of patients with either complications of the primary bariatric procedure or weight regain, revisional bariatric surgery can be beneficial. Currently, the morbidity rate after revisional RYGBP is found to be similar compared to primary RYGBP [10].

Due to the high demand of bariatric procedures, fast track care is becoming increasingly popular for bariatric surgery. It is known to increase the efficiency and thereby the productivity on a daily basis, without increasing the risk of postoperative complications [11,12].

Since revisional bariatric surgery has become a lot safer over the last years, the demand for revisional bariatric surgery is expected to increase and the implementation of fast-track protocols in bariatric surgery is growing worldwide, the question is raised whether a fast-track protocol would be safe to implement in revisional bariatric surgery.

**Sources for research and/or publication:** None.

**Disclosures:** M.R. van Wezenbeek has nothing to disclose. S. Pouwels has nothing to disclose. M.P. Buise has nothing to disclose. J.F. Smulders has nothing to disclose. S.W. Nienhuijs has nothing to disclose. G van Montfort has nothing to disclose.

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<http://dx.doi.org/10.1016/j.ijso.2016.02.008>

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This study aimed to evaluate the potential benefits and safety of a fast-track protocol in an unselected group of patients undergoing conversion to RYGBP bypass after VBG, AGB or SG.

## 2. Methods

For this retrospective analysis, medical charts of all patients undergoing revisional bariatric surgery between January 2005 and December 2013 at the Obesity Centre of the Catharina Hospital Eindhoven, a national referral centre for revisional bariatric surgery were reviewed.

This study has been approved by the Institutional Review Board of the Catharina Hospital and has been performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki. All patients undergoing revisional Roux-en-Y gastric bypass (rRYGBP) after either adjustable gastric banding (AGB), sleeve gastrectomy (SG) of vertical banded gastroplasty (VBG, either Mason or Mason-MacLean approach) were included. Other revisional procedures (such as conversion to sleeve gastrectomy) were excluded. This study was conducted according to the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) statement.

Before January 2011, all bariatric patients were treated according to the hospital's conventional care (CC) protocol. Since January 2011, all patients, including those submitted to revisional procedures, at the Catharina hospital undergo bariatric surgery according to the new centre-adjusted fast track care (FT) protocol.

### 2.1. Fast track versus conventional care anaesthesia

Table 1 gives an overview of the FT and CC protocol. Furthermore, the CC protocol from this hospital has been described in detail before [13]. The screening and preoperative work-up programme was identical for the FT and CC group.

Many differences are found between CC and FT. Premedication in the CC protocol consisted of acetaminophen 1000 mg and diaz-

epam 5 mg. No premedication was included in the FT protocol. In both groups, patients received thrombosis prophylaxis by 5000 units of Fraxiparin® (low-molecular weight heparin (LMWH)) and compression stockings. In both protocols, patients received standard haemodynamic monitoring (electrocardiography, pulse oximetry and non-invasive blood pressure measurement). In both groups, bispectral index monitoring and neuromuscular monitoring were routinely used to diminish the chance of awareness in the totally paralysed patient and to antagonize the muscle relaxant properly. Medication used for induction of the anaesthesia and for perioperative anaesthetic maintenance and postoperative analgesia are shown in Table 1.

At the end of the procedure, after antagonizing muscle relaxation with sugammadex, patients from the CC group were transferred from the operating room (OR) table to a normal ward bed by the OR personnel. In the FT protocol, desflurane and remifentanyl were discontinued upon notification from the surgeon so the patients could be extubated immediately after the procedure and thus were able to move from the operation table to their bed themselves.

Following to the CC protocol, all male patients with a Body Mass Index (BMI) over 45 kg/m<sup>2</sup> and all female patients with a BMI over 50 kg/m<sup>2</sup> were transferred to the intensive care unit (ICU) for respiratory monitoring due to a higher risk developing atelectasis, respiratory dysfunction and complications in combination with the postoperative use of morphine. In the FT group, all patients were admitted to the recovery and transferred to the short-stay surgical ward after 1–2 hours. Furthermore, in the FT group, revisional procedures were normally performed during regular bariatric programmes between primary bariatric procedures, whereas in the CC group, revisional patients were planned on a separate operating programme.

### 2.2. Surgical procedure

The technique of the rRYGBP differed between the different primary procedures. The main difference is found in the

**Table 1**  
Anaesthesia protocols.

Conventional care	Fast track care
Premedication	Premedication
Acetaminophen 1000 mg	None
Diazepam 5 mg	
Thrombosis prophylaxis	Thrombosis prophylaxis
Low molecular weight heparins (5000 IU)	Low molecular weight heparins (5000 IU)
Compression stockings	Compression stockings
Induction	Induction
Sufentanil 0.2–0.7 µg/kg	Piritramide 0.2–0.3 mg/kg
Propofol 2 mg/kg	Propofol 2 mg/kg
Rocuronium 0.6 mg/kg	Suxamethonium 1.0–1.5 µg/kg/hr
	Granisetron 3 mg
	Dexamethasone 8 mg
Maintenance	Maintenance
Remifentanyl 5–15 µg/kg/hr	Remifentanyl 5–15 µg/kg/hr
Sevoflurane or propofol 2–10 mg/kg/hr	Desflurane (6.0% vol.)
Rocuronium 0.4 mg/kg/hr	Bispectral index monitoring
Bispectral index monitoring	
Postoperative analgesia	Postoperative analgesia
Patient controlled analgesia (PCA)	Parecoxib 40 mg
with 1 mg morphine and droperidol	Acetaminophen 4dd 1000 mg
	Tramadol 3dd 100 mg
	Piritramide 0.2–0.3 mg/kg when indicated
Postoperative care	Postoperative care
Intensive Care Unit (ICU) or	Surgical ward
Surgical ward	
Additional concerns	Additional concerns
High labour for personnel (transfer of the patient)	Direct mobilization
Liberal intravenous fluid administration	Restricted intravenous fluid administration (max. 1L perioperative, max. 1L postoperative)
	Liberal oral fluid intake

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