

# World Journal of *Gastrointestinal Surgery*

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## Correct understanding and intervention of postoperative nausea and vomiting can provide reference for clinical practice

Jian-Chao Wang, Liang Wang

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### Abstract

In this editorial, we reviewed the article by Li *et al*. We aimed to explore various perspectives to further mitigate the risk factors for postoperative nausea and vomiting (PONV), which could significantly reduce its incidence and related postoperative complications. PONV is highly prevalent among patients undergoing bariatric surgery, yet there are relatively few related studies. Currently, the mainstream bariatric surgery methods include laparoscopic Roux-en-Y gastric bypass and laparoscopic sleeve gastrectomy. Despite the effectiveness of surgery in helping patients lose weight, postoperative PONV may occur, potentially leading to various complications (such as aspiration and wound dehiscence). A retrospective study by Li *et al* has compared the impact of different operative positions during laparoscopic sleeve gastrectomy on the incidence of PONV, providing new insights into the clinical practice aimed at reducing PONV incidence and thereby improving patient's postoperative experience.

**Key Words:** Postoperative nausea and vomiting; Bariatric surgery; Laparoscopic sleeve gastrectomy; Operative position; Obesity

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**Core Tip:** The occurrence of postoperative nausea and vomiting (PONV) is related to various factors. Identifying and avoiding the risk factors for PONV and implementing intraoperative interventions help to reduce or even avoid the incidence of PONV. This not only improves patient's postoperative experience but also reduces or avoids related postoperative complications, thereby enhancing short-term outcomes of patients.

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## INTRODUCTION

Globally, the advancement of social productivity has made human diets become more diverse. However, unhealthy eating habits, lack of exercise, increased stress, and environmental factors have significantly contributed to the rise in overweight and obese populations[1]. As predicted by the World Health Organization[2], approximately 60% of the global population will be overweight or obese by 2030[3]. Numerous studies have indicated that various forms of overweight or obesity are often associated with multiple chronic diseases (such as asthma, cancer, and diabetes), posing a significant threat to human health that urgently requires effective solutions[4]. Severely obese patients are typically unable to lose weight and maintain a healthy weight on their own, thus requiring bariatric surgery (BS), which is currently the only successful treatment for obese patients[5,6]. BS began in the 1950s with the initial surgical method of intestinal bypass surgery. However, as laparoscopic technology further develops, laparoscopic vertical banded gastroplasty, laparoscopic Roux-en-Y gastric bypass, and laparoscopic adjustable gastric banding emerged, leading to a rapid increase in the number of BS after the 21<sup>st</sup> century[7]. At present, the mainstream BS methods include Roux-en-Y gastric bypass and laparoscopic sleeve gastrectomy (LSG)[8]. Despite the effectiveness of BS in helping obese patients lose weight, postoperative nausea and vomiting (PONV) may occur, leading to complications such as aspiration and wound dehiscence[9,10]. Zhou *et al*[11] has shown that multiple factors (such as haloperidol, gender, age, smoking history, and history of PONV) are closely related to the occurrence of PONV. Exploring the risk factors for PONV from multiple perspectives helps reduce its occurrence and postoperative complications. However, there is limited research on whether the choice of operative position during BS affects PONV occurrence.

## DIFFERENT SURGICAL POSITIONS DURING LSG MAY AFFECT THE OCCURRENCE OF PONV

The article entitled by Li *et al*[12] has garnered significant interest. In a retrospective study, Li *et al*[12] have compared the incidence of PONV in patients undergoing BS when in prone split-leg or supine positions, and their findings offer new insights into the clinical practice of reducing PONV incidence and improving patient's postoperative experience. In this study, based on the clinical data from obese patients who underwent LSG between June 2020 and February 2022, the authors analyzed the impact of operative position on PONV incidence using multivariate logistic regression. In the prone split-leg operative position group, 15 patients (50%) experienced PONV, compared to 11 patients (36.7%) in the supine operative position group, but PONV incidence showed no significant difference between the two groups ( $P > 0.05$ ). The surgery time between the two groups was also compared. In short, in the split-leg prone operative position, the preoperative preparation time averaged  $35.00 \pm 22.25$  minutes, surgery time was  $168.23 \pm 46.24$  minutes, and hospitalization duration was 4  $\pm$  1 days; the supine group maintained an average of  $35.00 \pm 21.25$  minutes for preoperative preparation, with the surgery time of  $140.60 \pm 32.256$  minutes, anesthesia recovery of  $42.5 \pm 16.00$  minutes, and hospitalization duration of 4 days; only the surgery time showed a statistically significant difference ( $P < 0.05$ ). Regarding PONV incidence and postoperative antiemetic use among 60 patients, one or two antiemetic treatments were administered to 11 patients in the supine operative position group; 4 patients received antiemetic treatment more than 3 times; 6 patients needed treatment within 6 hours, 2 patients needed treatment within 6-12 hours, and 7 patients received antiemetic treatment for more than 12 hours. In the prone split-leg operative position group, 9 patients received antiemetic treatment 1-2 times and 2 patients received antiemetic treatment more than 3 times; 5 patients needed treatment within 6 hours, 2 patients needed treatment within 6-12 hours, and 4 patients received antiemetic treatment for more than 12 hours. No statistically significant difference ( $P > 0.05$ ) was found between the two groups. It has been shown that smoking status, body mass index (BMI), and gender are independent risk factors for PONV[13]. However, another study by Li *et al*[12] has found no association between these factors and PONV occurrence. This discrepancy may be due to that there may not be any true statistical differences in gender or BMI among patients undergoing surgery; moreover, the single-center nature of the study with a small sample size may introduce data bias. The operative position is not an independent risk factor for PONV despite the findings and there is no statistical significance in PONV incidence between the two groups ( $P > 0.05$ ), the study suggested that different operative positions during LSG may influence PONV occurrence. As the authors suggest, this may be due to the impact of different operative positions on intraoperative anesthesia dosage.



Halliday *et al*[14] have found that over half of the patients undergoing BS experience PONV within the first 24 hours postoperatively, with an incidence significantly higher than that reported by Li *et al*[12] (65% vs 43.3%). Researchers demonstrated a higher incidence of PONV in prone split-leg positions than that in supine positions reported by Li *et al* [12] (50% vs 36.7%), but the difference was not statistically significant ( $P > 0.05$ ). Variations in sample sizes may account for the discrepancy between different study results. Compared with the prone split-leg position, supine operative positions reported by Li *et al*[12] have been found to reduce PONV incidence, which provides a basis for the selection of patient positioning during LSG in clinical practice. However, it's worth further studying whether changing the prone split-leg operative position to a supine split-leg operative position could facilitate intraoperative procedures, improve patient experience of the operative position, and further reduce PONV incidence.

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## PROPHYLACTIC USE OF ANTIEMETICS CAN EFFECTIVELY REDUCE THE INCIDENCE OF PONV

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In the authors' study, over 43.3% of patients experienced PONV, yet only 18.3% received their first antiemetic treatment within 6 hours postoperatively, which is significantly lower than other study results[14]. Additionally, the authors noted that all patients received prophylactic antiemetic treatment at the end of the surgery. Routine intraoperatively prophylactic use of antiemetics could improve PONV-caused discomfort within the first 6 hours postoperatively, reduce the severity of PONV, and may avoid the use of antiemetics. For patients with higher BMI values and longer surgery times, the doses of anesthetic drugs used intraoperatively are also higher. Therefore, the routine application of prophylactic antiemetics during the surgery could be more beneficial for these patients. Additionally, Fathy *et al*[15] have suggested that during LSG, injection of magnesium sulphate and lidocaine mixture through pylorus can significantly decrease the incidence of PONV at 6 and 24 hours after surgery, and reduce the use of antiemetic drugs. Furthermore, previous studies have also shown that prophylactic use of antiemetics effectively reduces PONV incidence in patients undergoing general anesthesia[16,17]. For high-risk PONV patients, the combination therapy is often more effective than monotherapy.

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## THE SURGERY TIME IN THE PRONE SPLIT-LEG OPERATIVE POSITION GROUP WAS REMARKABLY LONGER THAN IN THE SUPINE OPERATIVE POSITION GROUP

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In the authors' study, the surgery time was notably longer than that reported in related literature. The authors explained that this discrepancy may be due to differences in surgical methods, team coordination proficiency, and the definition of total anesthesia duration. Additionally, the surgery time in the prone split-leg operative position group was remarkably longer than in the supine operative position group. Apart from the time differences arising from the coordination between the surgeons, assistants, and instrument nurses due to different positions, the prone split-leg position often requires the installation and adjustment of leg supports, which further increases the preparation time. This aspect warrants further research.

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## FURTHER UNDERSTANDING AND CLARIFYING THE RISK FACTORS OF PONV CAN PROVIDE REFERENCE FOR CLINICAL PRACTICE

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As revealed by the authors' study results, smoking status, BMI, and gender were unrelated to the incidence of PONV. However, a previous study has shown that in patients undergoing elective craniotomy, young females are important risk factors for PONV[18]. The influence of different surgical techniques on PONV incidence merits further investigation through multifactorial analysis to provide more evidence for clinical practice. Furthermore, accumulating studies have confirmed that patients undergoing laparoscopic surgery, those requiring perioperative opioids, the use of volatile anesthetics, and female patients are independent risk factors for PONV following BS[19-21].

As previously mentioned, the incidence of PONV may increase with the duration of surgical anesthesia, as longer anesthesia duration implies higher dose of anesthetic drugs. Moreover, Morino *et al*[22] has demonstrated that prolonged anesthesia and the use of remifentanyl during the surgery are risk factors for PONV. Additionally, high doses of opioids have been identified as independent risk factors for PONV incidence postoperatively[18]. Additionally, studies have shown that controlling opioid dosage can significantly reduce PONV incidence[23-26].

In the authors' study, both groups received opioids and volatile anesthetics. Additionally, compared to patients in the supine split-leg operative position, patients in the prone split-leg operative position required longer surgery time, potentially resulting in higher doses of these drugs. This may be another key reason for the higher incidence of PONV in the prone split-leg operative position group. This editorial further explored the findings of the authors' study from various perspectives, discussing relevant risk factors for PONV incidence in BS and providing additional references for clinical practice.

## CONCLUSION

The occurrence of PONV is associated with multiple factors. Recognizing and avoiding the risk factors for PONV, along with implementing intraoperative interventions, can reduce or even prevent PONV occurrence. This not only improves patient's postoperative experience but also reduces or avoids PONV-associated postoperative complications, thereby enhancing short-term outcomes of patients.

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