REVIEW ARTICLE
DOI: 10.26650/CURARE.2024.1433226
CURARE - Journal of Nursing 2024;6:38-41

Complications of Bariatric Surgery and Nursing Care

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Citation: Satır G., Dalkıran S.S. Complications of Bariatric Surgery and Nursing Care. CURARE - Journal of Nursing 2024;6:38-41. https://doi.org/10.26650/CURARE.2024.1433226

ABSTRACT

The incidence of obesity is increasing worldwide, and obesity is recognized as a public health problem. Obesity negatively affects the quality of life of individuals because it causes chronic diseases. Obesity is also known to cause psychiatric disorders. Although there are multiple options for the treatment of obesity, bariatric surgery is considered an effective and long-term method for treating obesity. Furthermore, the incidence of chronic diseases reportedly decreases with postoperative weight loss. With the advancements in technology, bariatric surgery is now being performed laparoscopically. Laparoscopic bariatric surgery is associated with a shorter hospital stay and less pain. Thus, the number of bariatric surgeries performed has increased worldwide in recent years. The incidence of complications after bariatric surgery is high in patients with coexisting chronic diseases. Early complications are observed within the 1st month after surgery, and late complications are observed after the 1st month. Bleeding, atelectasis, venous thromboembolism, anastomotic leakage, and rhabdomyolysis are early complications of bariatric surgery. Dumping syndrome, marginal ulcer, and nutritional and vitamin deficiencies are late complications of bariatric surgery. Nurses are essential members of the multidisciplinary teams for bariatric surgery, and they play an important role in patient care, patient education, and early recognition of complications. Nurses should have sufficient knowledge to provide high-quality care and reduce possible complications. In this review article, we have discussed the nursing interventions necessary to prevent the development of complications in patients undergoing bariatric surgery.

Keywords: Bariatric surgery, Complication, Nursing care

INTRODUCTION

Obesity and Bariatric Surgery

The World Health Organization defines overweight and obesity as abnormal or excessive fat accumulation that poses a health risk. The prevalence and incidence of obesity are increasing rapidly worldwide. According to the WHO, more than 650 million adults worldwide who were aged 18 years were obese in 2016 (1). Obese individuals are at high risk for developing several diseases, including cancer, coronary heart disease, type 2 diabetes mellitus, hypertension, gastroesophageal reflux, and degenerative joint disorders (2,3). Obesity increases the risk of developing numerous chronic diseases and reportedly causes psychiatric disorders such as depression and anxiety (4,5).

Bariatric surgery is accepted as the most effective treatment option for obesity (5,6,7,8). Bariatric surgery is performed in patients with a body mass index (BMI) of ≥40 kg/m^2 or patients with a BMI of ≥35 kg/m^2 in addition to comorbidities such as hypertension, diabetes, and sleep apnea (3,4). According to the Federation of Obesity and Metabolic Disorders Surgery, the number of bariatric surgeries performed worldwide has increased 10-fold in the last 25 years. Weight loss after bariatric surgery clinically improves several comorbidities present before surgery (9,10).

Complications of Bariatric Surgery and Nursing Care

Complications are frequently observed in patients undergoing bariatric surgery due to the complexity of patient's anatomy and the presence of comorbidities accompanying obesity (11, 12). The complications of bariatric surgery are divided into the following two categories: early and late. Early complications are observed in the first postoperative month, and late complications are observed after the first postoperative

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Submitted: 07.02.2024 • **Revision Requested:** 27.02.2024 • **Last Revision Received:** 25.03.2024 • **Accepted:** 26.03.2024

month (13). Nurses play an essential role in the preoperative and postoperative care of patients who have undergone bariatric surgery and in recognizing the signs and symptoms of complications (9,10).

Early Complications of Bariatric Surgery

Bleeding

Approximately 11% of patients develop bleeding after bariatric surgery (12). Bleeding is more common following Roux-en-Y gastric bypass surgery due to ulcer formation at the gastrojejunal anastomosis.

Bleeding occurring within 24–48 hours after bariatric surgery frequently occurs at the staple site (14). Thus, nurses need to regularly monitor a patient's vital signs, oxygen saturation, and drainage after surgery and ensures fluid balance (12, 15). Excessive amounts of blood in the drain, unstable vital signs, tachycardia, hypotension, fatigue, decreased hematocrit, melena, and hematemesis should be looked for by healthcare professionals. Upon receiving the physician's orders, nurses immediately initiate supportive treatment for bleeding and measure the patient's hematocrit (13, 14).

Atelectasis

Obesity suppresses respiratory functions in individuals (15). Impaired diaphragm function, abdominal distension, pain, and pleural effusion are the causes of postoperative atelectasis **(**16). Respiratory problems are common complications in the first few days after bariatric surgery. The nurses provide oxygen via a nasal cannula to patients with respiratory problems (5). Additionally, nurses frequently monitor a patient's respiratory rate, respiratory sounds, and oxygen saturation (17). Furthermore, patients are encouraged to mobilize early, by controlling the postoperative pain, to prevent postoperative pulmonary complications (15).

Spirometry encourages patients to achieve maximum inspiration by providing visual feedback, and it is widely used postoperatively to prevent pulmonary complications. In obese patients, deep breathing and coughing exercises are recommended before and after surgery to reduce pulmonary complications and increase lung capacity and oxygenation (18). To reduce the risk of atelectasis, nurses need to educate the patients about the importance of preoperative and postoperative spirometry, deep breathing, and cough exercises and ensure that the patients performs them (17).

Venous Thromboembolism

Venous thromboembolism (VTE) is the leading cause of morbidity and mortality following bariatric surgery, with an incidence of 3.5%–17%. Pharmacological and non-pharmacological methods are used to prevent VTE in patients after bariatric surgery. Patients at high risk for developing VTE should be identified preoperatively. Postoperatively, the risk of VTE is reduced by administering anticoagulant drugs, initiating early mobilization, and applying compression stockings. Furthermore, the nurses should observe the patients for signs of VTE. Low molecular weight heparin can be administered postoperatively according to the physician's instructions (19). The Enhanced Recovery After Surgery protocols also highlight the importance of early mobilization postoperatively. All patients should be evaluated preoperatively for the risk of deep vein thrombosis (20). Homans sign, hypersensitivity, unilateral gode-leaving (pitting) edema, local rise in temperature, and redness are essential clinical findings of deep vein thrombosis (21). Redness, swelling, temperature, tenderness, and pain in the limb should be evaluated before applying the stockings. The sock is applied when the patients is in the supine position. The importance of walking for 4 h on postoperative day 0 and 6 h on the following days should explained to the patient. Additionally, during the preoperative period, the nurses should inform the patients about the importance of foot-leg exercises and support the patient in performing them (15,16,17,18,19).

Anastomotic Leakage

Anastomotic leakage is the most feared complication of bariatric surgery, with a mortality rate of 15%. Anastomotic leakage can result in tachycardia, malaise, back and shoulder pain, respiratory distress, leukocytosis, high fever, abdominal pain, and abdominal tenderness. These symptoms usually appear on the 3rd postoperative day (12,13). Thus, nurses should monitor a patient's vital signs after surgery and recovery (17,22,23). Monitoring for tachycardia after the surgical procedure enables early recognition of complications, which will facilitate the use of necessary precautions. Nurses should also monitor abdominal distension, potassium level, and C-reactive protein level (23).

Elevated levels of potassium and C-reactive protein indicate anastomotic leakage. Furthermore, computed tomography with oral contrast material can be performed to identify the leak. Once the anastomotic leakage is determined, oral intake should be stopped, and intravenous feeds should be initiated upon physician's orders (13).

Rhabdomyolysis

Rhabdomyolysis is a rare complication of bariatric surgery. Skeletal muscle injury induces the release of intracellular enzymes and myoglobin. This leads to hyperkalemia, hypokalemia, diffuse intravascular coagulation, and acute renal failure. Prolonged operative time, presence of chronic disease, male sex, and overweight status are important risk factors for the development of rhabdomyolysis (13,17). Pain, numbness in the hips and back, and signs of myoglobinuria are observed in patients with rhabdomyolysis. Thus, postoperatively, the patient's vital signs should be monitored, patient's urinary output should be documented, feeds should be administered parenterally. Furthermore, the fluid-electrolyte balance should also be evaluated before and after bariatric surgery (17).

Late Complications of Bariatric Surgery

Dumping Syndrome

Dumping syndrome occurs when large amounts of simple carbohydrates are consumed after bariatric surgery (8, 24). Although the incidence of dumping syndrome is 7%–12% on average, it can increase to 50% in patients who have consumed large amounts of simple carbohydrates after gastric bypass. Individuals who undergo laparoscopic Roux-en-Y gastric bypass and who have a history of hyperlipidemia and gastroesophageal reflux disease are at high risk for developing dumping syndrome (25). Because the pyloric sphincter is usually bypassed after surgery, the ingested nutrients rapidly pass into the small intestine (17). The symptoms of dumping syndrome include gastrointestinal complaints (abdominal pain, diarrhea, bloating, and nausea) and vasomotor changes (flushing, palpitation, sweating, tachycardia, hypotension, and syncope). Postoperatively, the nurses should inform the patients regarding the appropriate diet. Furthermore, the patients should be instructed to separate the liquids from the solid foods and consume small amounts of food often. Nurses should instruct the patients to avoid foods with high sugar content and foods and beverages that trigger the syndrome. Furthermore, the patients should remain seated for 30 minutes after meals and drink 1.5 liters of water daily (8,25).

Marginal Ulcer

Marginal ulcers occur in approximately 2%–4.3% of the patients who undergo bariatric surgery. They are usually observed in the region of the anastomosis between the new gastric pouch and the small intestine (26). Marginal ulcers are usually observed more often in patients who undergo Roux-en-Y gastric bypass, with an incidence of 25% (24,27). A history of *Helicobacter pylori* infection, smoking, immunosuppression, nonsteroidal anti-inflammatory drug use, obstructive sleep apnea, female sex, smoking and alcohol addiction, substance abuse, and gastric pouch size are risk factors for the development of marginal ulcers. In addition, diabetes and hypertension reportedly slightly increase the risk of marginal ulcers (27,28). Marginal ulcers most commonly occur at the edge where the small intestine joins the gastric pouch, and they irritate the gastrointestinal mucosa (29,30). The symptoms of marginal ulcers include epigastric pain, nausea, vomiting, and hematemesis (15). Marginal ulcers are diagnosed by endoscopy, and treatments include proton pump inhibitors and nonsteroidal anti-inflammatory drugs (24, 30). Patients who smoke and use anti-inflammatory and/or corticosteroid drugs may require lifelong anti-ulcer treatment. Thus, patients should be informed about the risk factors for marginal ulcers in the postoperative period (26).

Nutritional and Vitamin Deficiencies

Nutritional and vitamin deficiencies are common after bariatric surgery. Restructuring the gastrointestinal anatomy causes nutritional and vitamin deficiencies due to changes in motility, pH, and enzymatic profiles (8). Bariatric surgery is associated with deficiencies in iron (33%–55%), calcium and vitamin D (24%–60%), vitamin B12 (24%–70%), and thiamine (33%–55%). Roux-en-Y gastric bypass surgery is frequently associated with deficiencies in iron (60%) and vitamin B12 (70%). Iron and vitamin B12 deficiencies can be supplemented orally or intravenously (3).

Following sleeve gastrectomy, patients are at a high risk of developing dehydration due to early satiety. Therefore, nurses need to inform patients regarding the consumption of daily fluids. Nurses should monitor the patients closely for Wernicke's encephalopathy that can occur due to thiamine deficiency after bariatric surgery. The symptoms of Wernicke's encephalopathy include neuropathy, myopathy, and encephalopathy. Thiamine deficiency can be corrected by replacing thiamine orally or intravenously (5,30). Selenium is an essential trace mineral and an important component of several enzymes and proteins in the human body. A meta-analysis reported that selenium deficiency developed in patients after bariatric surgery (31). Postoperatively, epigastric pain and vomiting may occur following each food intake. Thus, patients should be instructed on good food practices such as eating slowly, stopping eating once satiated, and avoiding simultaneous consumption of food and beverages to prevent gastrointestinal symptoms. Furthermore, patients should be advised to consume small meals rich in protein and fiber more frequently, chew their food well, eat slowly, and drink plenty of fluids. Patients should also be instructed to monitor the urinary output (5).

CONCLUSION

The number of bariatric surgeries is increasing daily worldwide and in Turkey. With the advancement of technology, the number of complications has decreased. However, patients are still at risk of developing some complications. The presence of chronic diseases in obese patients increases the incidence of complications. Nurses, who are essential multidisciplinary team members, should have sufficient knowledge to recognize the early signs and symptoms of bariatric surgery complications. Early identification of possible complications will reduce the duration of hospital stay and contribute to better patient outcomes.

Peer Review: Externally peer-reviewed.

Author Contributions: Conception/Design of Study- G.S.; Data Acquisition- G.S., S.S.D.; Data Analysis/Interpretation- G.S., S.S.D.; Drafting Manuscript- G.S., S.S.D.; Critical Revision of Manuscript- G.S., S.S.D.; Final Approval and Accountability- G.S., S.S.D.

Conflict of Interest: Authors declared no conflict of interest.

Financial Disclosure: Authors declared no financial support.

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