

**The key to management
is prevention**

by Constantine T. Frantzides,
MD, PhD, FACS, and
Minh Luu, MD

A photograph showing a person's feet standing on a white digital scale. The scale's dial is visible in the foreground, showing a red needle pointing to approximately 40. The background is a plain, light-colored surface. Overlaid on the right side of the image is the title 'Complications of Laparoscopic Roux-en-Y Gastric Bypass' in large, bold, yellow text.

Complications of Laparoscopic Roux-en-Y Gastric Bypass

History

In North America, bariatric surgery is increasing rapidly. In a population-based study, the total number of bariatric procedures performed in the United States per year between 1990 and 1997 ranged from 4,925 to 12,541. In 2001, the number of bariatric procedures increased sharply to 45,473 which correlated with the dissemination of laparoscopic bariatric operations. The impact of laparoscopy on bariatric operations

was even greater, as the number of bariatric procedures in the United States was estimated to reach more than 140,000 operations in 2005, including gastric bypass and other operations.

Although complication rates are relatively low, they can result in formidable disability. In general, bariatric surgery patients have little physiologic reserve and because of their large size, do not manifest complications in the same manner as normal-sized patients.

Management of Complications

The key to the management of complications is prevention. A multidisciplinary approach to the patient is needed in the preoperative assessment. The focus of this multidisciplinary team should be appropriate patient selection, the identification and optimization of comorbidities, and patient education.

When complications arise after bariatric surgery, a low threshold of suspicion is required to make an early diagnosis. Management of acute complications in morbidly obese patients remains a challenge because they often do not manifest many clinical signs and symptoms when they become ill. Also, morbidly obese patients have limited physiologic reserve and often do not manifest fever, abdominal pain or an increased white blood cell

Statistics on Obesity and the Increased Risk of Disease

Defining Overweight and Obesity

Overweight and obesity are both labels for ranges of weight that are greater than what is generally considered healthy for a given height. The terms also identify ranges of weight that have been shown to increase the likelihood of certain diseases and other health problems.

Definitions for Adults

For adults, overweight and obesity ranges are determined by using weight and height to calculate a number called the “body mass index” (BMI). BMI is used because, for most people, it correlates with their amount of body fat.

- ▶ An adult who has a BMI between 25 and 29.9 is considered overweight.
- ▶ An adult who has a BMI of 30 or higher is considered obese.

See the following table for an example.

Height	Weight Range	BMI	Considered
	124 lbs. or less	Below 18.5	Underweight
5'9"	125 lbs. to 168 lbs.	18.5 to 24.9	Healthy Weight
	169 lbs. to 202 lbs.	25.0 to 29.9	Overweight
	203 lbs. or more	30 or higher	Obese

It is important to remember that although BMI correlates with the amount of body fat, BMI does not directly measure body fat. As a result, some people, such as athletes, may have a BMI that identifies them as overweight even though they do not have excess body fat.

Other methods of estimating body fat and body fat distribution include measurements of skinfold thickness and waist circumference, calculation of waist-to-hip circumference ratios, and techniques such as ultrasound, computed tomography and magnetic resonance imaging (MRI).

Increased Prevalence

Since the mid-70s, the prevalence of overweight and obesity has increased sharply for both adults and children. Data from two NHANES surveys show that among adults aged 20 to 74 years the prevalence of obesity increased from 15.0% (in the 1976–1980 survey) to 32.9% (in the 2003–2004 survey).

The two surveys also show increases in overweight among children and teens. For children aged 2 to 5 years, the prevalence of overweight increased from 5.0% to 13.9%; for those aged 6 to 11 years, prevalence increased from 6.5% to 18.8%; and for those aged 12 to 19 years, prevalence increased from 5.0% to 17.4%.

Health Consequences

These increasing rates raise concern because of their implications for Americans’ health. Being overweight or obese increases the risk of many diseases and health conditions, including the following:

- ▶ Hypertension;
- ▶ Dyslipidemia (for example, high total cholesterol or high levels of triglycerides);
- ▶ Type 2 diabetes;
- ▶ Coronary heart disease;
- ▶ Stroke;
- ▶ Gallbladder disease;
- ▶ Osteoarthritis;
- ▶ Sleep apnea and respiratory problems;
- ▶ Some cancers (endometrial, breast and colon).

Although one of the national health objectives for the year 2010 is to reduce the prevalence of obesity among adults to less than 15 percent, current data indicate that the situation is worsening rather than improving. †

Courtesy of the Centers for Disease Control and Prevention (CDC), Department of Health and Human Services. For more information, visit www.cdc.gov.

count. Physicians and nurses caring for postoperative bariatric patients must maintain a high index of suspicion to prevent, recognize, diagnose and treat postoperative complications.

Surgery Complications

The purpose of this article is to highlight the major complications that occur following Laparoscopic Roux-en-Y gastric bypass.

Leaks

Leaks from anastomoses or staple lines are the most feared complications. Great care is taken to check the integrity of the gastrojejunostomy, both intraoperatively and postoperatively. Despite much effort, diagnosis of leaks can be challenging due to the patient population. Obese patients with anastomotic leaks may not manifest fever, leukocytosis or significant abdominal pain commonly seen in normal-sized patients. Persistent tachycardia sometimes is the only manifestation of a leak. Prompt surgical intervention is required to fix anastomotic leaks. Delay in diagnosis and treatment will result in sepsis and high morbidity and mortality.

Pulmonary Embolism

Pulmonary embolism (PE) is a complication of all surgical procedures, especially bariatric. Although PE occurs in approximately 1 to 2 percent of cases, it carries 20 to 30 percent mortality. Preventative measures include perioperative prophylaxis with subcutaneous anticoagulation, sequential compression devices and early ambulation. Patients with respiratory distress or lower extremity swelling (sign of deep venous thrombosis) should have a chest CT to evaluate for a PE. Treatment involves full anticoagulation or placement of a cava filter if the risk of postoperative bleeding is high.

Incisional Hernia-Wound Infection

Development of an incisional hernia after an open bariatric procedure is common, with an incidence of 10 to 20 percent. Wound infections and seromas are also common after open gastric surgery for morbid obesity. Large wound seromas and infections should be drained by opening up the wound, and cultures should be taken of the drainage. Ventral hernia that develops postoperatively and is asymptomatic should be repaired after the patient has reached maximal weight loss. If the patient has a symptomatic ventral incisional hernia, it should be repaired to prevent incarceration and strangulation of the bowel. These wound complications have almost been eliminated with the laparoscopic approach to bariatric surgery. Nevertheless, port site hernias can occur after laparoscopic bariatric procedures.

The incidence of trocar site hernias is less than 1 percent. Patients who present with localized pain near the trocar site,

with or without colicky pain at or around a port site, may have a partial or complete bowel obstruction. Occasionally, a palpable lump will be found on physical examination. Trocar site hernias are found radiographically on an abdominal CT. Once suspected by physical examination or found radiographically, these hernias should be reduced and repaired laparoscopically or open. They can be prevented with meticulous fascial closure of all trocar sites greater than 5mm. Preventative measures include strict adherence to sterile techniques and preoperative antibiotics. Specific to our technique of laparoscopic roux-en-y gastric bypass, the use of a protective barrier upon removing the EEA stapler has dramatically decreased our trocar site infection. These wounds should be opened and the drainage cultured. Wounds with cellulitis should be treated with antibiotics. These deep wounds may drain for weeks. It is important to keep the skin open to allow the deep space to drain and heal from the inside out.

Atelectasis-Pneumonia

Postoperative atelectasis is common in all surgical patients. It is the most common cause of early postoperative fever. Persistent atelectasis will lead to pneumonia. Due to incisional pain that is worsened by deep inspiration, patients tend to take shallow breaths as a protective mechanism. In contrast, patients that undergo laparoscopic surgery have less pain, thus are able to take deep breaths. The key to prevention of atelectasis is adequate pain control, use of incentive spirometry and early ambulation.

Conclusion

Most of the complications mentioned above can be reduced by standardization of the technique that allows for expeditious contact of the procedure (reduction of operative time), mobilization (ambulation) of the patient two hours post-op, hydration, encouragement of deep breathing and use of incentive spirometry. With laparoscopic surgery, patients are discharged within one to two days, and due to this, patients should be educated to identify symptoms and signs of disruption of anastomosis as well as other complications and should keep a low threshold to call the surgeon. †

Constantine T. Frantzides, MD, PhD, FACS, is professor of surgery at Northwestern University. He also serves as director at the Chicago Institute of Minimally Invasive Surgery and director, fellowship in advanced laparoscopic and bariatric surgery at Evanston Northwestern Healthcare.

Minh Luu, MD, is a member at the Chicago Institute of Minimally Invasive Surgery as well as surgical fellow in advanced laparoscopic and bariatric surgery at Evanston Northwestern Healthcare.

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