AMALIY VA TIBBIYOT FANLARI
ILMIY JURNALI
ISSN: 2181-3469
Jild: 03 Nashr:04 2024 yil

SCIENCE BOX

EARLY AND LATE COMPLICATIONS DURING BARIATRIC SURGERY

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Abstract: *In the modern world, obesity is considered a disease that has different etiological factors, a chronic, relapsing, progressive course, characterized by the formation of excessive fat deposits in the subcutaneous fat and internal organs, and is one of the three causes of the most serious health problems after smoking and various forms of violence . About 5% of all deaths worldwide are associated with obesity, and the cost to healthcare systems ranges from 2 to 7% in developed countries [1].*

Key words: *Sleeve gastrectomy (SL), laparoscopic Roux-en-Y gastric bypass (LRYGB), weight loss, metabolic parameters.*

At the same time, there is a noticeable increase in body mass index (BMI). As a result, the risk of developing metabolic disorders, diseases of the cardiovascular system, cancer, diabetes mellitus, dyslipidemia increases, and the load on ligaments and joints increases, which leads to dysfunction of the musculoskeletal system. Moreover, obesity is a clear social problem. Often, overweight people are perceived by others as less attractive, lazy, helpless, with low social status and low sexual attractiveness. The prevalence of obesity, defined as having a BMI (Quetelet index) ≥30 kg/m², is growing throughout the world [2]. According to the definition of the US National Institutes of Health, obesity is considered morbid if a BMI ≥35 kg/m² and the presence of diseases associated with excess weight, as well as with a BMI more than 40 kg/m², regardless of the presence of such diseases [3]. If you study the obesity statistics in Russia for 2020, you can see that this diagnosis was established for 1,909.7 thousand people [4]. In modern surgery, a whole section has emerged aimed at combating obesity and its consequences - bariatric surgery. Metabolic surgery was first formally defined in the 1978 book Metabolic Surgery as “the surgical manipulation of a normal organ or organ system to achieve a biological outcome with the goal of potentially improving health” [5]. Today, bariatric surgery is the standard in the correction of metabolic disorders. In addition, research in this area has opened new horizons of knowledge for understanding the sequence of development of metabolic disorders. It aims to change the shape and volume of the stomach, the rate of absorption in the intestine, or both, with the goal of causing weight loss. Surgical treatment methods arose due to the growing social significance of the problem and the failure of conservative therapy.One of the main reasons for the refusal of those sufferingobesepeople from the bariatric method of losing weight is the fear of developing postoperative complications. However, this kind of surgical intervention does not pose a great danger to the patient’s life, since in 99.9% of cases they proceed safely, 93% of patients endure the postoperative period without complications at all, in 7% of cases there arecomplicationsonly during the first 30 days after surgery. At the same time, the statistics take into account all types of bariatric operations (and they differ in level of complexity), repeated bariatric operations (always associated with an increased risk of complications) as well as open access operations (although in the modern world all bariatric operations, of course, need to be performed only

by laparoscopic access , that is, without abdominal incisions). It should also be understood that the greater the patient's weight, the greater the risk of complications. This risk is also affected by bad habits, such as smoking. Modern medicine has long come to the conclusion: the possible negative consequences after bariatric surgery are much lower and safer than the consequences of obesity itself, if you do not try to treat it.

Since gastric reduction operations are radical intracavitary operations, some complications may occur. The probability of early (30 days after surgery) complications is approximately 2-3%. If complications occur, the patient needs to stay in the hospital longer than originally planned; repeated operations, blood transfusions, intensive and antibacterial treatment may be necessary. Late complications can appear throughout the rest of life. The nature of complications and their frequency during different operations are also different. Complications of various surgeries are listed below. Postoperative complications after laparoscopic gastric bypass surgery.

Early complications. The most serious complication is inflammation of the abdominal cavity, or peritonitis, which can occur as a result of rupture of sutures in the intestines or stomach. The occurrence of peritonitis or serious suspicion of it requires immediate reoperation. Less commonly, bleeding occurs in the digestive tract or abdominal cavity. In these cases, repeat surgery is also sometimes performed. Complications may include deep vein or pulmonary thrombosis, myocardial infarction, pneumonia, abdominal infections, and wound infections. To prevent blood clots, the patient will receive blood thinning medications before and after surgery as directed by the surgeon. It is advisable for all patients to wear antithrombotic stockings or tights. Prophylactic antibiotics are used during surgery to prevent wound infections.

Frequency of early complications: rupture of sutures on the stomach or intestines 1-2%, bleeding 0.5-1%, wound infection 0.5-1%; cardiovascular and pulmonary complications 0.5-1%; death 0.3-0.5%.

Late complications after gastric bypass surgery

Stomach ulcer.5-10% of patients may develop gastric ulcers at the junction of the stomach and small intestine. The greatest risk of stomach ulcers occurs during the first three months after surgery. To reduce the risk, you can give the patient medications that reduce stomach acidity during the first three months after surgery. It is also important that patients should eat in small portions and carefully, especially in the first months after surgery.

Iron deficiency.20-30% of women with regular menstruation experience iron deficiency, to avoid and treat which iron supplements are taken. After surgery, iron is not absorbed as well as before surgery, so regular use of iron supplements of 40-50 mg/day is necessary after surgery. For patients who cannot tolerate iron-containing medications, an iron-containing solution is administered intravenously. Another possibility is to use birth control pills or hormonal medications to reduce the amount of bleeding during menstruation.

Vitamin B12 deficiency.Approximately 15% of patients without prophylactic additional therapy may develop vitamin B12 deficiency after surgery. Therefore, we recommend that all patients take vitamin B12. After gastric bypass surgery, 200 micrograms per day.

Lack of calcium and vitamin D.After surgery, the body may not absorb enough calcium. Patients are advised to take a calcium with vitamin D supplement (1600 mg calcium and 800 mg vitamin D per day), especially those with dairy allergies.

Diarrhea.After surgery, many patients experience diarrhea from eating sugary or high-fat foods.

Dumping syndrome.After gastric bypass surgery, food goes directly into the small intestine. If the patient consumes foods high in sugar (for example, soft drinks, condensed milk), this immediately

provokes an increase in blood sugar levels. The body reacts to this by releasing large amounts of insulin, which in turn causes a drop in sugar levels. Symptoms may include feeling tired, feeling unwell, rapid heartbeat and nausea. Sometimes there is also pain and diarrhea.

Gallstones.Rapid weight loss can in turn cause the formation of gallstones. Almost 35% of patients may develop gallstones after surgery. Patients whose gallstones are found before surgery can have them removed during bariatric surgery.

Intestinal obstruction.2-3% of patients after gastric bypass surgery require reoperation due to intestinal obstruction. The cause may be postoperative adhesions in the abdominal cavity or the occurrence of intestinal obstruction due to pinching of the intestine due to its improper fastening.

Excess skin.As a result of rapid weight loss, the patient may develop hanging folds on the abdomen, buttocks, hips, and shoulder girdle after surgery. It is known that approximately 20% of patients resort to the help of a plastic surgeon to get rid of them. It is advisable for patients to undergo plastic surgery no earlier than 1.5 years after bariatric surgery.

Constipation.Some patients after surgery complain of constipation, which mainly occurs from a decrease in the amount of food taken, which entails a decrease in intestinal motility and frequency of bowel movements. Drinking liquids between meals is important. If there is a need to take a laxative, it is recommended to choose a laxative in liquid form. Consult a coloproctologist orgastroenterologist.

Hair loss.After all bariatric surgeries, temporary, greater than normal hair loss may occur during the first year. The cause of this is unknown and it goes away over time.

Alcohol addiction.Research shows that after gastric surgery the risk of alcohol dependence increases. Therefore, we recommend that you do not drink alcohol after surgery or do so in reasonable quantities. After surgery, alcohol acts quickly, even after drinking small quantities.

Complications after gastric band surgery

Early complicationsafter gastric band surgery occur in 2-5% of patients (bleeding, perforation of the digestive tract, infection, pneumonia). Fortunately, most complications are mild. Early mortality following laparoscopic gastric band surgery is 0.1%.

Late complications, caused by migration of the gastric band, fracture or constriction of the small ventricle, occur in 4-11% of patients. Symptoms of these complications usually include severe abdominal pain, heartburn, vomiting, weight gain, and port infection. Typically, these complications can only be treated with new surgery. If there is insufficient weight loss or weight gain, 15-20% of banded patients will opt for new bariatric surgery and will be re-operated. After gastric banding, gallstones, hanging folds of skin, constipation or diarrhea, and heartburn may form.

Heartburn.Postoperative reflux that occurs can be alleviated with the help of the surgeon. The cause of reflux may be a bandage that is installed too high or the fact that the usual diet has not been changed enough.

Port related problems.After surgery, a blue spot may appear around the port insertion site, this is a bruise that usually disappears within one or two weeks. If you notice swelling in the port area, contact your surgeon immediately.

Complications after vertical gastrectomy surgery

Early complicationsappear in 4-6% of cases: bleeding in the area of the staple suture or spleen, leaks, fistulas, accumulation of pus in the abdominal cavity, a very thin gastric tube (which can cause swallowing complications). In the long term, the stomach may stretch again and the weight will begin to increase again. A study that followed patients who had vertical gastrectomy surgery for 6 years

found that 25% of patients required repeat surgery. This was usually caused by weight gain or persistent heartburn. Vertical gastrectomy may cause heartburn or worsen it. Also after this operation, gallstones, loose skin folds, constipation and diarrhea may occur.

Complications after gastric plication surgery

Early complicationis bleeding during surgery or immediately after surgery, perforation of the stomach wall and, as a result, its leakage, damage to organs during surgery, difficulty swallowing and vomiting due to a narrow gastric tube.

Complications associated with the cardiovascular and pulmonary systems.Early complications occur in 1% of patients and may require reoperation. Late complications include pinching or leakage of the stomach wall due to gaps in the suture, possible weight gain or insufficient weight loss. Gastric plication is a new operation and there is very little data on its long-term effects (more than a year after surgery).

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