



TITLE: GASTRIC RESECTION: EXPLORING ITS IMPACT ON HEALTH AND WELL-BEING

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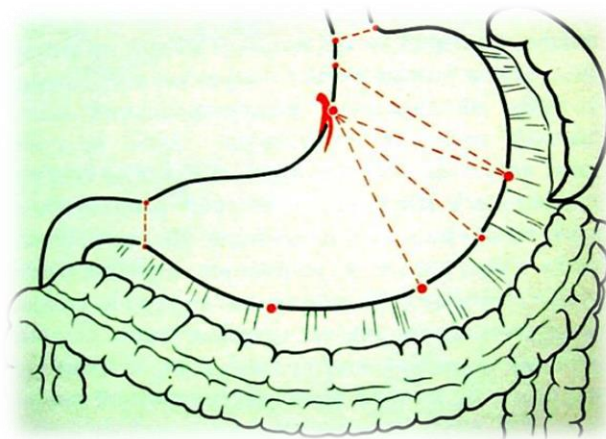
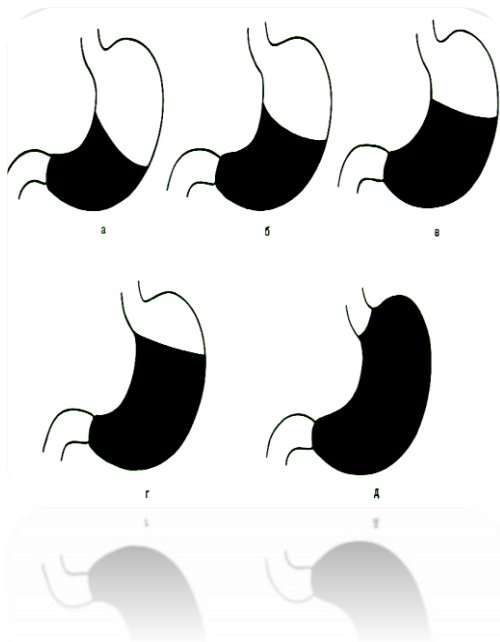
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ABSTRACT

Gastric resection, a commonly performed surgical intervention for various gastrointestinal disorders such as cancer, ulcers, and obesity, introduces significant physiological and lifestyle changes with profound implications for patient health and well-being. This systematic review comprehensively explores the multifaceted outcomes associated with gastric resection, encompassing alterations in dietary patterns, nutritional deficiencies, dumping syndrome, challenges in weight management, and the spectrum of post-operative complications. By synthesizing a breadth of empirical research and clinical observations, this review aims to provide a nuanced understanding of the complex landscape surrounding gastric resection. Emphasis is placed on the critical need for tailored patient care, interdisciplinary collaboration among healthcare professionals, and proactive management strategies aimed at optimizing patient outcomes and fostering post-operative well-being. Through a holistic approach to patient care, this review underscores the importance of addressing the intricate needs of individuals undergoing gastric resection to promote resilience and enhance their overall quality of life.

Introduction: Gastric resection is a significant surgical procedure widely used to address various gastrointestinal conditions, ranging from cancer to obesity. It's not just a surgical intervention; it's a life-altering event for patients, impacting their health and daily routines in profound ways. In this review, we delve into the intricate consequences of gastric resection, examining how it reshapes not only physiological functions but also nutritional equilibrium and overall well-being. By drawing from a wealth of research and clinical insights, we aim to shed light on the multifaceted nature of this procedure and emphasize the importance of

personalized care and comprehensive support for patients navigating the challenges of gastric resection.



Consequences of gastric resection can include:

1. **Changes in eating habits:** After gastric resection, patients may need to eat smaller, more frequent meals to avoid discomfort or complications. Some patients may also experience changes in taste or appetite

After gastric resection, changes in eating habits are common due to the reduced size of the stomach. Patients may need to adjust their diet and eating patterns to accommodate this change. Here are some key changes in eating habits that may be necessary after gastric resection:

1. **Smaller, more frequent meals:** With a smaller stomach capacity, patients may need to eat smaller meals more frequently throughout the day to ensure adequate nutrition and prevent discomfort.
2. **Avoiding certain foods:** Some foods, such as those high in sugar, fat, or fiber, may be more difficult to digest after gastric resection. Patients may need to avoid these foods or consume them in limited quantities to prevent digestive issues.
3. **Chewing food thoroughly:** Properly chewing food can aid in digestion and reduce the risk of discomfort or complications after gastric resection. Patients should take their time to chew each bite thoroughly before swallowing.
4. **Drinking liquids between meals:** Consuming liquids with meals can fill up the stomach quickly and may lead to discomfort or dumping syndrome. Patients are often advised to drink liquids between meals rather than during meals to prevent these issues.
5. **Monitoring portion sizes:** Patients should be mindful of portion sizes and listen to their body's signals of fullness after gastric resection. Overeating can cause discomfort and may not be well-tolerated with a smaller stomach size.



6. Working with a dietitian: A dietitian can provide personalized guidance on nutrition and meal planning after gastric resection. They can help patients create a balanced diet that meets their nutritional needs while taking into account the changes in eating habits post-surgery.

By making these adjustments to their eating habits and following the recommendations of their healthcare team, patients can navigate the changes in diet and nutrition that come with gastric resection effectively and support their recovery and long-term health outcomes.

2. Nutritional deficiencies: With a smaller stomach, there is less space for food to be digested and absorbed. This can lead to deficiencies in essential nutrients such as vitamins and minerals. Patients may need to take supplements or work with a dietitian to ensure they are getting adequate nutrition.

Nutritional deficiencies can occur after gastric resection due to changes in the digestive system that impact the absorption of essential nutrients. Here are some common nutritional deficiencies that may occur after gastric resection and strategies to address them:

1. Vitamin B12 deficiency: Gastric resection can affect the production of intrinsic factor, a protein necessary for the absorption of vitamin B12. Patients may require lifelong vitamin B12 supplementation through injections, sublingual tablets, or high-dose oral supplements to prevent deficiency.

2. Iron deficiency: Reduced stomach acid production after gastric resection can impair the absorption of iron. Iron supplementation may be necessary to prevent anemia. Consuming iron-rich foods such as lean meats, poultry, fish, legumes, and fortified cereals can also help maintain adequate iron levels.

3. Calcium deficiency: Gastric resection can impact calcium absorption, leading to a risk of osteoporosis and bone health issues. Patients may need calcium supplements and should focus on consuming calcium-rich foods such as dairy products, leafy greens, tofu, and fortified plant-based milks.

4. Fat-soluble vitamin deficiencies: Gastric resection can affect the absorption of fat-soluble vitamins A, D, E, and K. Patients may require supplementation or increased intake of foods rich in these vitamins, such as fatty fish, nuts, seeds, leafy greens, and fortified foods.

5. Protein deficiency: Inadequate protein intake can lead to muscle loss, impaired wound healing, and other health issues after gastric resection. Patients should prioritize consuming high-quality protein sources and may benefit from protein supplements to meet their daily protein needs.

6. Monitoring and supplementation: Regular monitoring of nutrient levels through blood tests and working with a healthcare provider to address any deficiencies is crucial for individuals who have undergone gastric resection. Personalized supplementation plans tailored to the individual's specific needs can help prevent and manage nutritional deficiencies effectively.

7. Nutritional counseling: Seeking guidance from a registered dietitian who specializes in bariatric surgery can help patients develop a well-balanced diet plan that meets their nutritional needs post-gastric resection. The dietitian can provide recommendations on nutrient-dense foods, portion sizes, meal planning, and supplementation to support optimal health.

Deficiencies before surgery

Consequences of obesity and lack of intake due to wrong nutritional habit

- Vitamin A
- Vitamin B12
- Vitamin C
- Vitamin D
- Folic acid
- Calcium
- Iron
- Selenium
- Zinc



Deficiencies after surgery

Nutrients malabsorption and lack of intake due to wrong nutritional habit

- Vitamin A
- Vitamin B12
- Vitamin B1
- Vitamin C
- Vitamin D
- Vitamin K1
- Vitamin E
- Folic acid
- Calcium
- Copper
- Iron
- Selenium
- Zinc

Main risks

Anemia, ataxia, hair loss, hyperoxaluria, osteoporosis, poor wound healing, Wernicke encephalopathy

Management of bariatric patients

Healthy nutrition, exercise routine follow-ups after surgery specific treatment with dietary supplements

By addressing these potential nutritional deficiencies through supplementation, dietary modifications, and regular monitoring, individuals who have undergone gastric resection can reduce the risk of complications and support their long-term health and well-being.

3. Dumping syndrome: This condition occurs when food moves too quickly from the stomach to the small intestine, leading to symptoms such as nausea, vomiting, diarrhea, and dizziness. Dumping syndrome can be managed through dietary modifications and medications.

Dumping Syndrome

Definition

Dumping syndrome occurs when the stomach empties its contents rapidly into the small intestine. Partially digested food causes excess fluid to build up in the small intestine.

Side Effects

- Diarrhea
- Nausea
- Vomiting
- Dizzy
- Stomach cramping
- Heart palpitations

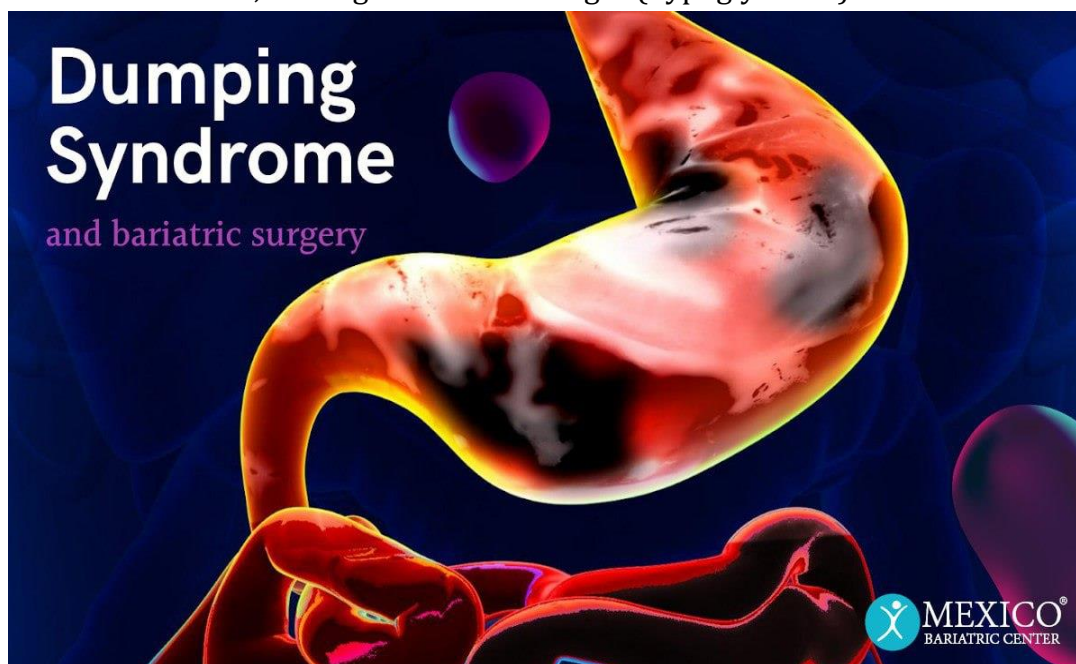
Dumping syndrome is a common complication that can occur after gastric resection, particularly after procedures like gastric bypass surgery. Dumping syndrome can be classified into early dumping syndrome and late dumping syndrome, each with its own set of symptoms and triggers.

1. Early dumping syndrome: This occurs shortly after eating and is characterized by symptoms such as nausea, vomiting, abdominal cramps, diarrhea, lightheadedness, sweating, rapid heartbeat, and flushing. Early dumping syndrome is caused by the rapid emptying of undigested food into the small intestine, leading to a shift of fluid from the bloodstream into the intestine.

Strategies to manage early dumping syndrome include:

- Eating smaller, more frequent meals throughout the day
- Avoiding high-sugar foods and beverages that can trigger rapid sugar absorption
- Consuming protein-rich foods to slow down gastric emptying
- Drinking fluids between meals rather than with meals
- Avoiding lying down immediately after eating

2. Late dumping syndrome: This occurs 1-3 hours after eating and is characterized by symptoms such as weakness, sweating, shakiness, dizziness, confusion, and palpitations. Late dumping syndrome is caused by a rapid rise in blood sugar levels followed by an overproduction of insulin, leading to low blood sugar (hypoglycemia).



Strategies to manage late dumping syndrome include:

- Consuming complex carbohydrates and protein-rich foods to help stabilize blood sugar levels
- Avoiding high-sugar foods and beverages that can cause rapid spikes in blood sugar
- Eating smaller, balanced meals with a mix of protein, fiber, and healthy fats
- Monitoring blood sugar levels regularly and seeking medical advice if hypoglycemia occurs

It is essential for individuals experiencing dumping syndrome after gastric resection to work closely with their healthcare team, including a dietitian, to develop a personalized eating plan that helps manage symptoms and meets their nutritional needs. Making dietary

modifications, adjusting meal timing and composition, and following lifestyle recommendations can help minimize the impact of dumping syndrome on daily life and overall well-being.

4. Weight loss: Gastric resection can lead to significant weight loss, which may be beneficial for patients with obesity but can also be a concern for those who are already underweight or at risk of malnutrition.



Weight loss is a common outcome after gastric resection procedures, such as gastric bypass surgery or sleeve gastrectomy. The extent of weight loss can vary depending on factors like the type of surgery, the individual's starting weight, lifestyle changes, and adherence to post-operative guidelines.

After gastric resection, weight loss typically occurs in two phases:

- 1. Rapid Weight Loss Phase:** In the first few months after surgery, individuals often experience rapid weight loss due to the restrictive or malabsorptive nature of the procedure. During this phase, the stomach's reduced capacity or altered digestion leads to decreased calorie intake and absorption, resulting in significant weight loss.
- 2. Slower Weight Loss Phase:** After the initial rapid weight loss period, weight loss tends to stabilize, and individuals may continue to lose weight at a slower pace over the following months to years. This phase requires ongoing adherence to dietary guidelines, regular physical activity, and behavioral changes to maintain weight loss and support long-term success.

Factors that can influence weight loss after gastric resection include:

- **Dietary habits:** Following a balanced, nutrient-dense diet that meets post-operative guidelines is crucial for successful weight loss and overall health.



- Physical activity: Regular exercise helps burn calories, build muscle mass, and support weight management.
- Behavioral changes: Adopting healthy lifestyle habits, such as mindful eating, stress management, and adequate sleep, can contribute to sustained weight loss.
- Follow-up care: Regular follow-up appointments with healthcare providers, including dietitians and bariatric specialists, help monitor progress, address challenges, and provide ongoing support.



It is essential for individuals who have undergone gastric resection to work closely with their healthcare team to establish a personalized plan for post-operative care, including dietary modifications, lifestyle changes, and monitoring of weight loss progress. Additionally, psychological support and counseling may be beneficial to address emotional aspects of weight loss and promote long-term success.

5. Increased risk of certain complications: Gastric resection can increase the risk of complications such as infections, leaks at the surgical site, and blood clots. Patients should be monitored closely after surgery to detect and manage any potential issues.

While gastric resection procedures like gastric bypass surgery and sleeve gastrectomy are effective in promoting weight loss and improving health outcomes for many individuals, they also come with potential risks and complications. Some of the common complications associated with gastric resection procedures include:

1. **Nutritional deficiencies:** Due to the altered anatomy and reduced stomach capacity, individuals who have undergone gastric resection may be at risk of developing nutritional deficiencies, particularly in vitamins and minerals such as vitamin B12, iron, calcium, and folate. Regular monitoring of nutrient levels and adherence to dietary supplementation guidelines are essential to prevent deficiencies.
2. **Dumping syndrome:** Dumping syndrome occurs when food moves too quickly from the stomach into the small intestine, leading to symptoms such as nausea, vomiting, abdominal



cramping, diarrhea, sweating, and lightheadedness. This condition can be triggered by consuming high-sugar or high-fat foods and requires dietary modifications to manage symptoms.

3. Gastroesophageal reflux disease (GERD): Some individuals may experience worsening or new onset of GERD symptoms after gastric resection procedures, particularly in cases where the lower esophageal sphincter is weakened or the stomach acid is not adequately contained. Lifestyle modifications, medications, or additional surgical interventions may be necessary to address GERD.

4. Ulcers: Gastric ulcers can develop in the remaining portion of the stomach or in the small intestine after gastric resection procedures. Risk factors for ulcers include smoking, nonsteroidal anti-inflammatory drugs (NSAIDs) use, and *Helicobacter pylori* infection. Treatment may involve medications to reduce stomach acid production or antibiotics to eradicate *H. pylori*.

5. Gallstones: Rapid weight loss following gastric resection can increase the risk of developing gallstones due to changes in bile composition and reduced gallbladder emptying. Symptoms of gallstones may include abdominal pain, bloating, nausea, and vomiting. In some cases, surgical removal of the gallbladder (cholecystectomy) may be necessary.

6. Bowel obstruction: Adhesions or strictures in the digestive tract can lead to bowel obstruction following gastric resection procedures. Symptoms may include abdominal pain, bloating, vomiting, and constipation. Treatment may involve conservative measures, such as bowel rest and hydration, or surgical intervention to relieve the obstruction.

7. Psychological issues: Weight loss surgery can have a significant impact on an individual's mental health, leading to changes in body image, self-esteem, relationships, and eating behaviors. Some individuals may experience depression, anxiety, or disordered eating patterns post-operatively and may benefit from counseling or support groups.

It is important for individuals considering gastric resection procedures to discuss the potential risks and complications with their healthcare providers and undergo a thorough evaluation to determine their candidacy for surgery. Close monitoring, adherence to post-operative guidelines, and ongoing follow-up care are essential for minimizing risks and optimizing outcomes after gastric resection.

Conclusion: Gastric resection isn't merely a surgical procedure; it's a journey that profoundly affects patients' lives. This review has explored the myriad consequences of gastric resection, from immediate dietary changes to long-term nutritional challenges and post-operative complications. Our findings underscore the crucial importance of tailored patient care and interdisciplinary collaboration in addressing the diverse needs of individuals undergoing gastric resection. By adopting proactive management strategies and empowering patients with the resources they need, we can optimize outcomes and promote enduring well-being post-resection.

Discussion: The discussion surrounding gastric resection extends beyond medical considerations to encompass a holistic approach to patient care. While the surgical aspect is crucial, it's equally essential to address the nutritional, psychological, and lifestyle factors that shape patients' experiences post-resection. Interdisciplinary collaboration among healthcare professionals, including surgeons, nutritionists, psychologists, and social workers, is vital for



providing comprehensive support to patients throughout their journey. Moreover, ongoing research and innovation are needed to refine surgical techniques, minimize complications, and enhance patient outcomes. By embracing a patient-centric paradigm and fostering collaboration across disciplines, we can navigate the complexities of gastric resection more effectively and ultimately improve the quality of life for affected individuals.

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