



## Surgery for Obesity and Impact on Non-Alcoholic Liver Steatosis; The Puzzle Completion

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Metabolic syndrome and obesity are emerging diseases in the world and understanding the different approach for correction of them is important enough for clinicians in different specialties surgeons, internists, specialists in nutrition for review the new surgical methods for obesity.

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Non-alcoholic fatty liver disease (NAFLDs) is a health hazards and emerging threat in the recent three decades (1). NAFLD is frequently associated with obesity, diabetes mellitus and the metabolic syndrome. However, nowadays, its prevalence has grown to 30% among general population with the growing pattern in developing countries (2, 3). Liver cirrhosis and hepatocellular carcinoma (HCC) are the main causes of liver-related morbidity and mortality in the communities (4). Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are the major worldwide risk factors for chronic liver disease, (5-7). There are emerging evidence regarding contribution of diabetes, obesity, intake of high fat foods and metabolic syndrome to higher incidence of HCC in the world (8). Changing the life style and modification of obesity can help us for the best achievements to prevent these consequences of the liver disease (9). Unfortunately, changing the life style is not always possible and most of the drugs are ineffective to control obesity and fatty liver (10), however, weight loss is mandatory for stopping

the natural history of NAFLDs (1). Obesity is also associated with hypertension, insulin resistance, diabetes type II, hyperlipidemia and ischemic heart disease (8). The epidemy of obesity in Iran and the world is a major public health issue. More than one fourth of adults are obese and more than 3% are morbid obese in Iran (11). High prevalence of fatty liver among the patients undergoing bariatric surgery has increased the interest in foregut bariatric surgery as a potential treatment for NAFLDs. Surgery for morbid obesity, bariatric surgery, is the most durable treatment for this disease (12). For the first time, surgical approach for stomach cancer showed the significant weight loss after surgery and the researchers noticed the importance of these types of surgery for morbid obesity (12). Roux-en-Y gastric bypass surgery for morbidly obese in type II diabetic subjects is associated with malabsorption co-morbidity, so recently; it has been replaced by the laparoscopic sleeve gastrectomy (LSG). LSG, creating a narrow tube-like stomach, is a restrictive procedure designed to decrease appetite by reducing the ability

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of the stomach to distend and producing the sensation of fullness with minimal oral intake (2, 11, 13). LSG has been shown in initial studies to produce excellent excess weight loss comparable with laparoscopic Roux-en-Y gastric bypass in many series with a very low incidence of major complications and death (2, 12). LSG is not technically as difficult as laparoscopic Roux-en-Y gastric bypass and it has a restrictive malabsorptive approach. Moreover, this type of surgery with minimum nutritional concern leads to a significant weight loss (3, 11). It seems that LSG is a definitive weight loss surgery for some patients and it can reverse the comorbidities. However, this type of surgery has some early or delayed disadvantages with potential complications especially if is done by non-expert surgeons. Several methods are available in the bariatric algorithm, however; LSG has been gaining traction as an effective mean for weight loss in patients with morbid obesity (12, 14-16).

The impact of foregut bariatric surgical procedure on natural history of liver histology among severe obese patients is not clear enough. Unfortunately, there are not any randomized clinical trials to evaluate different types of foregut bariatric surgical procedure in treatment of NAFLDs and most of studies are retrospective or prospective cohorts (10). Increase in lipid profile and insulin resistance after significant weight loss reported following foregut bariatric surgery (13). Significant increase in the prevalence and severity of liver steatosis and ballooning has also been reported one and five years, following different types of bariatric surgery (17) such as gastric band, biliary intestinal bypass and gastric bypass. A meta-analysis published in 2008, showed the beneficial effects of bariatric surgery on the liver histology among patients with NAFLDs (18) in which steatosis, steatohepatitis, and fibrosis appear to be improved or completely resolved after bariatric surgery. However, we should not forget the lack of RCTs for assessments of benefits and harms of bariatric surgery as a therapeutic approach for patients with NAFLDs (19). Finally, the role of bariatric surgery in patients with established cirrhosis due to NAFLDs is not clear until now.

In conclusion, I would like to emphasize on the importance of LSG, not only as an established and alternative therapy to the other ones in NAFLDs, but also as a complementary for the puzzle of weight loss in morbid obesity in Iran, considering that patients follow up after surgery by a team consists of nutritionists, hepatologists and psychiatrists could be useful to prevent the relapse.

## Authors' Contribution

Seyed Moayed Alavian Contributed 100% to prepare this article.

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