Effect of Morbid Obesity Surgery on the Liver

Essay

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In General Surgery

By

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[قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ
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List of Abbreviations

ALT	Alanine Aminotransferase.
ANA	antinuclear antibody
ASMA	antismooth muscle antibody
AST	Aspartate Aminotransferase.
ATP	Adult Treatment Panel.
AUROC	Area under reciver operating characteristic.
BMI	Body mass index.
BPD	Biliopancreatic Diversion.
CCK	Cholecystokinin.
ChREBP	carbohydrate responsive element binding protein.
CK	cytokeratin.
CoA	coenzyme A.
CPT	carnitine palmitoyl transferase.
CT	Computerized Tomography.
DGAT	diacylglycerol acyltransferase.
DNL	de novo lipogenesis**.**

List of Abbreviations (Cont.

DS	Duodenal Switch
DVT	Deep venous thrombosis.
ECG	Electrocardiogram.
ELF	Enhanced liver fibrosis.
ELISA	Enzyme-linked immunosorbent assay.
FA	fatty acid.
FAO	Fatty acid oxidation
FFA	Free fatty acid.
FXR	farmesoid X receptor
GIP	Gastrointestinal Peptide.
HDL	High density lipoprotein.
IGT	impaired glucose tolerance.
IHTG	intrahepatic triglyceride.
IR	insulin resistance.
LAGB	Laparoscopic Adjustable Gastric Banding.

List of Abbreviations (Cont.

LRYGB	Laparoscopic Roux-en-Y Gastric Bypass.
LSG	Laparoscopic sleeve gastrectomy.
MRI	Magnetic Resonance Imaging**.**
NAFLD	nonalcoholic fatty liver disease
NAS	NAFLD activity score.
NASH	nonalcoholic steatohepatitis
NASH CRN	NASH Clinical Research Network
NIDDM	noninsulin dependent diabetes mellitus.
OR	odds ratio
PPAR	peroxisome proliferator activated receptor.
PTH	Parathyroid Hormone.
RCT	randomized controlled trial.
RYGB	Roux-en-Y Gastric Bypass.
SG	Sleeve Gastrectomy.

List of Abbreviations (Cont.

SREBPs	sterol regulatory element binding proteins.
T2DM	type 2 diabetes mellitus
TG	triglyceride.
TZDs	Thiazolidinediones.
UDCA	ursodesoxycholic acid.
VLDL	very low-density lipoprotein**.**

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Introduction

Morbid obesity is defined as a body mass index (BMI) greater than 40 kg/m2 or a BMI greater than 35 kg/m2 with associated complications including, but not limited to, diabetes, hypertension, or obstructive sleep apnea.It is a very serious condition that effect on the health,causing increase in morbidity &mortality rate either due to obesity itself or obesity related diseases.The pathophysiology of obesity is complex and poorly understood, but it includes genetic, behavioral, psychological, and other factors. Family studies suggest that heredity may explain 67% of the population variance in BMI.However, genetic factors are unlikely to account fully for the rapid increase in the prevalence of obesity.Declining rates of physical activityand increases in the consumption of energy dense foods may play a role **(Ledikweet al., 2006).**

Morbid obesity is the most significant risk factor for the development of non-alcoholic fatty liver disease (NAFLD),a term that encompasses a spectrum of liver pathology ranging from fatty liver alone (hepatic steatosis) to concomitant hepatic inflammation (non-alcoholic steatohepatitis or NASH). Although it is a relatively benign condition, hepatic steatosis increases risk of developing NASH whichmay then progress to more advanced stages of liver disease such as fibrosis and cirrhosis. NAFLD is estimated to occur in 30 to 100% of obese adults and is associated with hepatic enlargement (hepatomegaly),elevated serum aminotransferase levels and insulin resistance **(Clouston et al., 2005)**.

The first treatment of morbid obesity is dietary and lifestyle changes. Although this strategy may be effective in

some patients, only a few morbidly obese individuals can reduce and control weight through diet and exercise. The majority of patients find it difficult to comply with these lifestyle modifications on a long-term basis. When conservative measures fail, some patients may consider surgical approaches (**August et al., 2008).**

Surgery for obesity, termed bariatric surgery(from the Greek wordbaros, which means weight), is a treatment for morbid obesity in patients who fail to lose weight with conservative measures. There are numerous different surgical techniques available. These different techniques have heterogeneousmechanisms of action, with varying degrees of gastric restriction that creates a small gastric pouch, malabsorption of nutrients, and metabolic changes that result from gastric and intestinal surgery. Besides its positiveeffects on weight loss and its acceptable ratesof weight-loss maintenance, bariatric surgery isthe treatment offering the best cost-effectivenessratio in the medium term.The bariatric surgery procedures including different types e.g. : Sleeve gastrectomy, Mini-Gastric Bypass and Gastric Bypass**(Aikenhead et al., 2011)**.

There is an improvement of the cases after surgical treatment than medical treatment as part of the major prospective SOS study, compared patients whohad undergone open surgery with patients who had followed medical(non-surgical) therapy. The results show that, at one year, the surgicalpatients had lost more weight than those inthe conventionally treated group. The majorbenefit of bariatric surgery was maintained aftersix years, compared with weight gain In terms of weight reduction alone, the SOSstudy shows that bariatric surgery is moreeffective than non-surgical treatment. on examination of The effect of significant weight loss on nonalcoholic fatty liver disease,

including nonalcoholic steatohepatitis (NASH) and hepatic fibrosis by had paired liver biopsies, the first at the time of surgery and the second after weight loss, There were major improvements in lobular steatosis, inflammatory changes, and fibrosis at the second biopsy **(ElisaFabbrini et al., 2010**).

In the other study of 70 patients who underwent repeat liver biopsy after dramatic weight loss, we demonstrate significant and wide spread improvement, or resolution, of NAFLD and NASH. More than one-third of the patients had postoperative liver biopsies that showed resolution of steatosis and inflammation, and 20% of the patients had at least some reversal of fibrosis. No patient experienced a progression of abnormal liver morphology or a deterioration of hepatic function, as indicated by persistently normal liver enzymes. The results are highlight the important role that obesity and, by extension, the metabolic syndrome plays in the NAFLD disease process. Conversely, The data also show the profound beneficial effect that weight loss, possibly by the associated amelioration of comorbidities, has on the reversal of steatosis and fibrosis. Additionally, they have been able to achieve these outcomes safely, with no mortality and minimal morbidity **(Choudhury and Sanyal 2004)**.

In conclusion, weight loss after surgery provides major improvement or resolution of obesity and metabolic syndrome-associated abnormal liver histological features in severely obese case **(ElisaFabbrini ET AL., 2010**).

Aim of the Work

The aim of this work is to clarify the effect of obesity on the liver & the role of surgery in management of fatty liver disease.