Laparoscopic Metabolic Surgeries

Essay

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in General Surgery.

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Contents

List of Abbreviations

AGB	**:**	Adjustable gastric band
ACCP	**:**	American college of chest physicians
BS	**:**	Bariatric surgery
BPD	**:**	Biliopancreatic diversion
BPD/DS	**:**	Biliopancreatic diversion with duodenal switch
BIB	**:**	BioEntericsintragastric balloon
BP	**:**	Blood pressure
BMI	**:**	Body mass index
CVD	**:**	Cardiovascular Diseases
CT	**:**	Computed tomography
CHD	**:**	Congestive heart failure
CHAOS	**:**	Coronary heart disease, hypertention, atherosclerosis, obesity and stroke
DGRY	**:**	Derivation gastrojejunal Roux-en-Y
DM	**:**	Diabetes mellitus
DJBS	**:**	Duodenojejunal bypass sleeve
EWL	**:**	Excess weight loss
GI	**:**	Gastro intestinal
GE	**:**	Gastroesophageal
GIB	**:**	Gastrointestinal bleeding
GRY	**:**	Gastrojejunal Roux-en-Y
GJ	**:**	Gastro-jejunostomy
GSHS	**:**	Global School-based Student Health Survey
GLP-1	**:**	Glucagon like peptide - 1
GIP	**:**	Glucose-dependent insulinotropic peptide

HDL	**:**	High density lipoprotein
HDL-C	**:**	High density lipoprotein cholesterol
HTN	**:**	Hypertension
IT	**:**	Ileal transposition
IHD	**:**	Ischemic heart diseases
LAGB	**:**	Laparoscopic adjustable gastric band
LMGB	**:**	Laparoscopic mini gastric bypass
LRYGB	**:**	Laparoscopic Roux-en-Y gastric bypass
LSG	**:**	Laparoscopic sleeve gastrectomy
LDL	**:**	Low density lipoprotein
METS	**:**	Metabolic syndrome
MGB	**:**	Mini gastric bypass
MO	**:**	Morbid obesity
NCEP	**:**	National cholesterol educational program
NHLBI	**:**	National Heart, Lung and Blood Institute
NIH	**:**	National institute of health
NICE	**:**	National Institute of Health and Clinical Excellence
NEFA	**:**	Non estritified free fatty acids
OSA		Obstructive sleep apnea
PTH	**:**	Parathyroid hormone
PYY	**:**	Peptide YY
PA	**:**	Physical activity
PAI	**:**	Plasminogen activator inhibitor
POD	**:**	Post-operative day
RRYGB	**:**	Robotic Roux-en-Y gastric bypass
RYGB	**:**	Roux-en-Y gastric bypass

SADI-S	**:**	Single anastomosis duodenoileal bypass with sleeve gastrectomy
SAS	**:**	Sleep apnea syndrome
SG	**:**	Sleeve gasterctomy
IDF	**:**	The international diabetes foundation
SASI	**:**	The single anastomosis sleeve ileal bypass
TAF1	**:**	Thrombin activatable fibrinolysis inhibitor
TG	**:**	Triglycerides
US	**:**	United States
UGI	**:**	Upper gastrointestinal
VTE	**:**	Venous thromboembolism
VBG	**:**	Vertical banded gastroplasty
VLDL	**:**	Very low density lipoprotein
Vit	**:**	Vitamin
WHO	**:**	World Health Organization

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Abstract

It has been estimated that 190 million people worldwide have diabetes mellitus (DM) and it is likely that this will increase to 324 million by 2025. This epidemic is taking place both in developed and developing countries and the combination of DM, obesity, and metabolic syndrome is now recognized as one of the major threats to human health in the 21st century.

Roux-en-Y gastric bypass (RYGB) is the most commonly performed bariatric operation, ameliorates virtually all obesity-related comorbid conditions, the most impressive being a dramatic resolution of type 2 DM (T2DM). After RYGB, 84% of patients with T2DM experience complete resolution, and virtually all have improved glycemic control. Increasing evidence indicates that the impact of RYGB on T2DM cannot be explained by the effects of weight loss and reduced energy intake alone.

Potential mechanisms underlying that direct antidiabetic impact of RYGB include increased lower intestinal hormones as glucagon-like peptide-1 (GLP-1), altered physiology from excluding ingested nutrients from the upper intestine, and other changes yet to be fully characterized. Research aimed at determining the relative importance of these effects and identifying additional mechanisms promises not only to improve surgical design but also to identify novel targets for antidiabetic medications.

Key words: diabetes mellitus, metabolic syndrome, Roux-en-Y gastric bypass, glucagon-like peptide-1, Obesity, Bariatric surgery.

Introduction

It has been estimated that 190 million people worldwide have diabetes mellitus (DM) and it is likely that this will increase to 324 million by 2025. This epidemic is taking place both in developed and developing countries and the combination of DM, obesity, and metabolic syndrome is now recognized as one of the major threats to human health in the 21st century ***(Geloneze, 2008).***

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characterized. Research aimed at determining the relative importance of these effects and identifying additional mechanisms promises not only to improve surgical design but also to identify novel targets for antidiabetic medications ***(Thaler and Cummings, 2009).***

The effect of purely restrictive procedures in improving glucose control is directly proportional to the degree of weight loss ***(Mingrone, 2008).***

Two hypotheses have been proposed to explain the early effects of bariatric surgery on T2DM, the hindgut hypothesis and the foregut hypothesis ***(Mingrone and Castagneto-Gissey, 2009).***

Rubino and Marescaux have developed an experimental animal model with duodenal exclusion. A surgery with only two anastomoses was performed on rats of the Goto-Kakizaki species, the most widely used animal model of nonobese T2DM. A duodeno-jejunal bypass and a simple enteroenteric anastomosis was performed, preserving the gastric volume ***(Pitompo, 2008).***

The continual advances in our knowledge of the pathogenesis and hormonal disorders of morbid obesity lead to the development of new technical options. In Europe, multinational studies are being assembled to look

at a procedure called ileal transposition (IT). First described by Koopmans and Sclafani in 1981. This procedure has actually been proposed as being potentially useful in treating glucose intolerance related to obesity because of the potential for increasing GLP-1 secretion ***(Strader et al., 2004).***

Aim of the work

The aim of this work is to discuss the metabolic syndrome and its pathophysiology, with special focus on the role of minimally invasive laparoscopic procedures in the management of this syndrome.