Early Experience of Metabolic Surgery

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ABSTRACT:

BACKGROUND:

Laparoscopic sleeve gastrectomy LSG is known to be a highly effective treatment for morbid obesity and many related conditions including type 2 diabetes mellitus (T2DM) and the metabolic syndrome.

OBJECTIVE:

To assess the effectiveness of (LSG) on glucose homeostasis in morbidly obese diabetic patients and it shows early experience of metabolic surgery.

METHODS:

Prospective clinical case series study conducted in Al-Jumhoori Teaching Hospital and involved 20 patients (17 females and 3 males); their age (22-54 average 37 years) underwent LSG and the level of glucose evaluated at different times by measuring fasting blood glucose level, glycosylated hemoglobin (HbA1C).

RESULTS:

The initial body weight 70-142(110Kg); BMI 31.8-53.9 (45.16Kg/m^2); two patients with diabetes mellitus and BMI less than 35Kg/m^2 involved.

The mean level of fasting blood glucose assessed and found to be (202,165,130,107,96 mg/dl) in preoperative ,one-day postoperative,10 days, three and six-months interval; while the level of HbA1C were(10.2,9,7.2,6.1) in the preoperative ,10 days,3 and 6 months interval respectively.

CONCLUSION:

LSG is an effective procedure to decrease weight for morbid obesity and it resolve T2DM in 90% while improvement of T2DM occurred in 10 % so LSG is an effective procedure to treat T2DM and the level of glucose declined significantly started from early postoperative and continued till 6 months.

KEYWORDS: metabolic, bariatric, sleeve, diabetes.

INTRODUCTION:

Obesity is an increasingly serious health problem globally and is strongly associated with several medical problems. Some of these problems are considered direct complications of long-standing obesity [1,2]. These problems include an increased risk of cardiovascular morbidity and mortality, hypertension, sleep apnea, and diabetes mellitus (DM) and dyslipidemia. Among these and other associated comorbidities, the strongest link is found between obesity and DM [3,4]. Approximately, 80% of individuals with type 2 DM are obese [5]. The risk of developing DM increases with the severity and duration of obesity and a central distribution of body fat .

Currently, bariatric surgery is the only interventional method proved to induce significant long-term weight reduction which can result in significant clinical improvement in DM after weight loss [6].

According to the new international diabetes federation IDF definition, for a person to be defined as having the metabolic syndrome they must have: Central obesity plus any two of the following four factors(Raised triglycerides or specific treatment for this lipid abnormality ,Reduced HDL cholesterol ,Raised blood pressure systolic , Raised fasting plasma glucose (FPG)or diagnosed type 2 diabetes

The metabolic syndrome is a cluster of the most dangerous heart attack risk factors: diabetes and prediabetes, abdominal obesity, high cholesterol and high blood pressure (A quarter of the world's adults have metabolic syndrome) [7].

Bariatric surgery defined as the surgery related to the treatment of obesity and the British Obesity and Metabolic Surgery Society BOMSS defined it as Surgeons involved in obesity management (www.bomss.org.uk) while Metabolic surgery

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defined as the procedures for weight loss, whether designated as restrictive, restrictive/malabsorptive, malabsorptive, and others, or neuro-hormonal, all fall under the definition as the operative manipulation of a normal organ or organ system to achieve a biological result for a potential health gain [8]. As most metabolic surgery is performed as part of a conventional bariatric program, Rubino et al described these procedures as Bariatric\Metabolic procedures [9].

Metabolic/bariatric surgery has been shown to be the most effective and long lasting treatment for morbid obesity and many related conditions and results in significant weight loss[10,11,12]. The risk of death is about 0.1 percent and the overall likelihood of major complications is about 4 percent (13). Current guidelines [14,15] strongly recommend that conventional bariatric surgery be considered for the treatment of T2DM in surgical candidates with poorly controlled diabetes and a BMI > 35 kg/m^2. However, according to the international diabetes federation (IDF) position statement from March 2011, surgery should be considered as an alternative treatment option in patients with a BMI between 30 and 35 when the diabetes cannot be adequately controlled with an optimal medical regimen, especially in the presence of other major cardiovascular disease risk factors. In Asians, the BMI cut-off point is 2.5 points lower compared with Western populations to reflect the higher obesity risk profile in Asian populations[16]. Historically, that report was the first to include bariatric surgery in a diabetes treatment algorithm. For individual diabetic patients with a BMI < 30 kg/m^2, some data have shown encouraging results[17-20].

OBJECTIVES:

To assess the effectiveness of (LSG) on glucose homeostasis in morbidly obese diabetic patients and it shows early experience of metabolic surgery in Iraq.

METHODS:

Prospective clinical case series study conducted in Al-Jumhoori Teaching Hospital in Iraq-Mosul and involved 20 patients (17 females and 3 males) diagnosed as metabolic syndrome; their age (22-54 average 37 years) underwent LSG and the level of glucose evaluated at different times by measuring fasting blood glucose level, , glycosylated hemoglobin (HbA1C),also lipid profile checked and blood pressure measured to assess the beneficial of LSG as metabolic procedure.

RESULTS:

The initial body weight 70-142(110Kg); BMI 31.8-53.9 (45.16Kg/m^2); two patients with diabetes mellitus and BMI less than 35Kg/m^2 involved.

The mean level of fasting blood glucose assessed and found to be (202,165,130,107,96 mg/dl) in preoperative ,one-day postoperative,10 days, three and six-months interval; while the level of HbA1C were(10.2,9,7.2,6.1) in the preoperative ,10 days,3 and 6 months interval respectively.

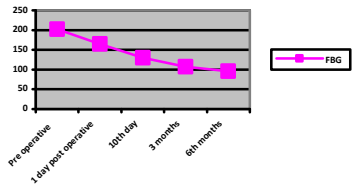

Fig1:Shows Fasting blood glucose (FBG)in different times.

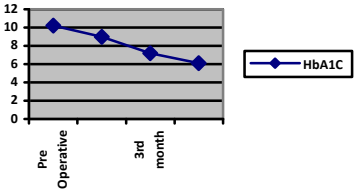

Fig2:Shows HbA1C in different times.

Their BMI reduced from 45.16 to 42.7,37 and 34.6 Kg/m^2 during 1st, 3rd and 6th month interval as shown in figure 3.

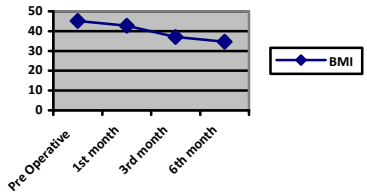

Fig 3:Shows BMI changes during 1st, 3rd and 6th months interval.

Those 20 patients diagnosed as case with metabolic syndroms depending on (FBG,TG,HDL and blood pressure levels)and those with normal level but use medication regularly also considered increased level depending on the International Diabetes Federation (IDF) definition, their metabolic syndrome resolved or improved after LSG as shown in this figure.

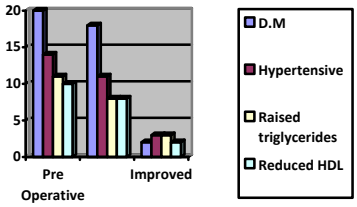

Fig 4:Comorbidities resolved and improved after 6 months from LSG.

DISCUSSION:

Much of the improvement of diabetes has been related to the excess weight loss after surgery. However, some effects appear to be independent from weight loss occurring prior to it. Although early reports concentrated on the clinical effects of the improvement of diabetes, recent works have focused on glycemic control and measurements of insulin resistance [21]. Regarding LSG, recent studies have shown that this procedure is associated with a marked reduction of ghrelin secretion which is produced by the gastric fundus involved in meal time hunger regulation and it is also known to exert several diabetogenic effects (increase in growth hormone, cortisol, and epinephrine). Therefore, its suppression could contribute to improved homeostasis [22]. This study shows improvement of FBG after LSG even before weight loss and after 6 months FBG and HbA1C are within normal level which means cure of D.M (resolved) recorded in 90% while 10% improved ;these results compared with several studies that recorded decrease of FBS from 1st [23]or 5th day[24] and maintainance of FBG and HbA1C recorded in the following months

Several studies done on effect of LSG on amelioration of T2DM, results proved that after LSG a sharp and significant reduction of serum glucose and insulin concentration recorded. This improvement or resolution of diabetes was contributed to a significant declining in the BMI [25,26] and percent of excess weight loss which is also evident in this study.

Many studies compared resolution of D.M results being more common following the predominantly malabsorptive and the mixed malabsorptive-restrictive procedures, compared to the purely restrictive operations[27].It has been proposed that weight loss accounts for resolution of T2DM following purely restrictive procedures[28,29] .In contrast, it has been hypothesized that changes in gastrointestinal hormonal secretion would favor not only the higher T2DM resolution rate but also an earlier improvement of glucose tolerance in procedures in which the stomach and part of the gut are bypassed. Sleeve gastrectomy (SG) has

recently emerged as a restrictive bariatric procedure[30]. SG was originally conceived as the first stage for achieving weight loss and reducing co-morbidities in addition to weight loss as seen in this study at least for the short time while the largest study In meta-analysis, Buchwald et al.[31]

CONCLUSION:

Bariatric surgery studies published from January 1990 until April 2006. Were reviewed the cases of patients in whom there was resolution of clinical manifestations and improvement in short-term and long term and it shows best results with BPD followed by RYGB then AGB(LSG is not involved) [27,31]

Obesity related Comorbidties resolved or improved in this study during short time follow up and in particular dyslipidemia ,hypertension and D.M and its worthy to mention that these results also noted both in short term and long term (five year follow up) [32].

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