

## **Biliopancreatic diversion, duodenal switch, and vertical sleeve gastrectomy operation of patients with Body mass index more than sixty Retrospective study**

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### **ABSTRACT:**

#### **BACKGROUND:**

Obesity is a complex metabolic disorder with significant health and economic consequences due to related co-morbid conditions, including diabetes, cardiovascular disease, and certain cancers, and increased mortality. So when body mass index increase mortality increase.

#### **OBJECTIVE:**

Asses and study the result of operations of obesity associated with malabsorption operations to measure the body mass index more than sixty and To prove the benefit of this type of bariatric surgery in weight loss within short period and its benefit in decreasing co-morbidity.

#### **PATIENTS AND METHODS :**

A retrospective study conducted in Baghdad Teaching Hospital and Dijla Private Hospital from June 2011 to June 2012 where the follow-up of eleven patients admitted to surgical ward and underwent the operation of Biliopancreatic diversion, Duodenal switch and Sleeve gastrectomy were analyzed the enhance people with diseases and postoperative diseases and complication. All patients were given nutritive instructions three months prior to surgery which was rich in vitamins and low fat.

#### **RESULTS:**

from the analysis of the results we found a rapid decline in body weight as well as the Body mass index, where in the 1<sup>st</sup> 3 months BMI dropped of about 22%, after 6 months BMI dropped 39% and dropped more than 50% after 12 months. Also this study show clear and significant improvement in treatment of sleep problems, DM, and HPT.

#### **CONCLUSION:**

operation of this type is important for weight loss in morbidly obese patients in addition to high and noticeable improvement in association comorbid diseases.

**KEY WORDS:** body mass index ,malabsorption operation , obesity ,biliopancreatic bypass.

### **INTRODUCTION:**

Unfortunately, noninvasive therapeutic options for weight loss, including behavioral and pharmacologic approaches, are only modestly efficacious and rarely durable, particularly for patients with severe obesity. In contrast, bariatric surgery induces substantial weight loss, decreases the incidence and severity of obesity-related comorbidity, and improves mortality<sup>(1)</sup>. Due to its inherent risk, however, surgical therapy is only available to a subset of patients with severe or complicated obesity. Safer, less-invasive options for the severely obese and for the large proportion of patients with significant obesity-related co morbidity who do not meet the current

criteria for weight-loss surgery are needed<sup>(2)</sup>.

Current surgical options include adjustable gastric banding (AGB), vertical banded gastroplasty (VBG), sleeve gastrectomy (SG), Roux-en-y-gastric bypass (RYGB), and biliopancreatic diversion with duodenal switch (BPD/DS).

Scopinaro et al<sup>(3)</sup> introduced the BPD in 1979, combining a distal gastrectomy with a long enteric bypass. Hess et al<sup>(4)</sup> subsequently modified this procedure by combining it with a DeMeester duodenal switch<sup>(5)</sup> (described for treatment of bile reflux gastritis) to create the modern biliopancreatic diversion with duodenal switch (BPD/DS) procedure for morbid obesity. Although initially described as a major open abdominal procedure, further advances in

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minimally invasive equipment and techniques now allow the option of performing BPD/DS as a laparoscopic procedure<sup>(6,7)</sup>. However, persistent concerns about the technical difficulty and potential complications of this procedure have limited its introduction into many bariatric practices<sup>(7)</sup>.

Body mass index(BMI) = weight (kg) / (height (m))<sup>2(8)</sup> and the weight guidelines includes the following, Over weight BMI >25Kg/m<sup>2</sup>, Obese BMI 30-34Kg/m<sup>2</sup>, Severely Obese BMI 35-39 kg/m<sup>2</sup>, morbidly obese > BMI 40 kg/m<sup>2</sup> and super morbid obese BMI=45-50 kg/m<sup>2</sup>. The super morbid obese associated with medical problems<sup>(9)</sup>.

Bariatric surgery can traditionally be divided into restrictive and malabsorptive procedures. The restrictive procedures decrease food intake and promote an early feeling of satiety at meals. Malabsorptive procedures reduce the absorption of nutrients and thereby promote weight-loss. Some procedures are a combination of both<sup>(9)</sup>.

Indications of bariatric surgery includes the following :

Patients with BMI  $\geq$  40kg/m<sup>2</sup>

Patients with BMI  $\geq$  35kg/m<sup>2</sup> associated with sever medical conditions(HPT,DM,Sleep apnoea and heart failure).

Patients who is prepared and willing to commit to the lifestyle changes that will be necessary following surgery.<sup>(10)</sup>

Patients not eligible for surgery includes the following:

History of substance abuse ,eating disorder or major psychological problem which is untreated and/or unresolved, Patients who are too ill or too high risk for surgery and Women who may become pregnant soon.<sup>(10)</sup>

### **PATIENTS AND METHODS:**

All operations were done under general anaesthesia. The patient was placed in the supine position. The skin of the abdomen was prepped and draped in the usual sterile fashion. Roof top incision was made in all patients .

Biliopancreatic bypass involved performing an open sleeve gastrectomy , Duodenal switch, leaving the pylorus. The pylorus is then anastomosed with a Roux-en-Y retrocolic limb of distal ileum 250 cm proximal to the ileocolic valve. The proximal ileum is then anastomosed end to side with the distal ileum 75 cm proximal to the ileocolic junction (all anastomoses were done by staplers)

All procedures were performed by the same team (surgeon experienced in bariatric surgery, assistants, and anesthetists).

In all operations tow drains is putted ,one near the stomach and another in the pelvis.

At the end of operation, all patients were kept intubated and mechanically ventilated with 100% oxygen for variable periods. Full reversal was done when the patient regained consciousness and spotaneous recovery of muscle power. Extubation was done after repositioning the patient in a head up position to be followed by oxygen inhalation via face mask. Intermittent boluses of morphine were given to treat the post operative pain as per-patient demand. All the patients were discharged to the ward after they have a sustained SpO<sub>2</sub> > 95% on room air for at least 30 minutes.

Patients can start oral intake after 5 days. Patients were discharged when they felt they could take enough liquids to maintain adequate hydration, without nausea, vomiting or pain. The drain was removed after 6 days post operative. Proton pump inhibitors were used in all patients for the first month postoperatively and then as needed.

The surgeon, at the outpatient clinic, checked all patients after 4 weeks. Thereafter patients were followed up every 3 months until the end of the first year then yearly. Data is collected from the follow up chart of the clinic.

The type of food postop. is fluidy diet for tow weeks, then for tow months is semisolid and solid diet there after.

Statistical Package for Social Sciences version 20 (SPSS v20) is used for data input and analysis. Continuous variables presented as mean  $\pm$  SD and discrete variables presented as numbers and percentages. test for two independent samples used to test the significance of difference in mean of two samples and Friedman's test used to test the significance of difference between means of more than two related samples. Findings with P value < 0.05 were considered significant.

### **RESULTS:**

Study sample is composed of 11 patients. Their ages ranged from 20 to 53 years with mean of 32.5  $\pm$  11.5 year. Five patients aged in their twenties, two in thirties, three in forties and only one patient in fifties. Five patients (45.5%) were males and six patients (54.5%) were females (table 1). Although males were younger (mean age was 26.4  $\pm$  8.9 year) than females (mean age was 37.5  $\pm$  11.6 year); this difference in mean age was not significant (P > 0.05).

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Regarding clinical co morbid condition; Seven patients (63.6%) had diabetes ,Six patients (54.5%) had hypertension ,Eight patients (72.7%) had sleep apnea (table 1).

Operation times varied from three to six hours with mean duration of  $3.5 \pm 0.9$  hour. Body mass index (BMI) initially (before operation) varied from 65 to 115  $\text{kg}/\text{m}^2$ , with a mean of  $82.5 \pm 14.0$   $\text{kg}/\text{m}^2$  .

Initial BMI in males varied from 65 to 100  $\text{kg}/\text{m}^2$ , with mean of  $82.8 \pm 12.6$   $\text{kg}/\text{m}^2$ .Initial BMI in females varied from 70 to 115  $\text{kg}/\text{m}^2$ , with mean of  $82.5 \pm 16.3$   $\text{kg}/\text{m}^2$ . There was no significant difference in mean initial BMI among males and females ( $P > 0.05$ ) .

The Decrease in BMI as mean and percentage throughout the monitoring period; specifically at months three, six and was significant ( $P < 0.05$ ),

that at the end of the first year the mean BMI had decreased into 41.1  $\text{kg}/\text{m}^2$  giving rise to an average decrease of 50.4% from initial BMI (table 2)(figure1)

Concerning Post-operative complications:

None of the patients developed gastric leak, gastric retention, hernia, abnormal serum albumin, or pancreatitis .Intestinal obstruction postoperatively was only partial and affected five patients (45.5%) Serum calcium decreased as well only in five patients (45.5%)(table3).

Regarding obesity associated medical conditions: All patients with diabetes, hypertension and sleep apnea had improved after the operation. All patients went through this operative intervention were satisfied(figure2)

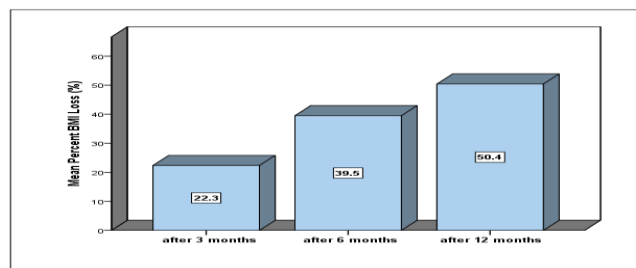
**Table 1: Distribution of study sample according to some personal and clinical charaterisitics.**

Variables	11 (100.0)
Age (year); Min - Max	20 - 53
Age (year); Mean $\pm$ SD	32.5 $\pm$ 11.5
Age Group (year)	
• 20-29	5 (45.5)
• 30-39	2 (18.2)
• 40-49	3 (27.3)
• 50-59	1 (9.1)
Sex	
• Male	5 (45.5)
• Female	6 (54.5)
Diabetes	7 (63.6)
Hypertension	
Sleep Apnea	

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**Table 2: Descriptive statistics for study sample regarding length of operation and BMI monitoring.**

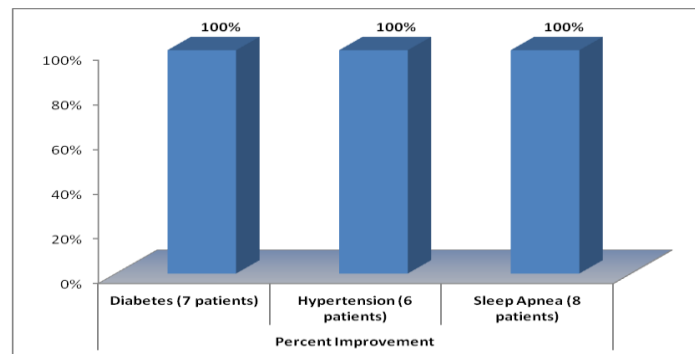
Variables	Min - Max	Mean $\pm$ SD	P value
Length of the Operation (hr)	3 - 6	3.5 $\pm$ 0.9	---
Initial mean BMI (kg/m <sup>2</sup> )			0.960
• Male (total of 5)	65 - 100	82.8 $\pm$ 12.6	
• Female (total of 6)	70 - 115	82.3 $\pm$ 16.3	
Total Sample	65 - 115	82.5 $\pm$ 14.0	
BMI (kg/m <sup>2</sup> ) for Total Sample			< 0.001
• before Operative Intervention	65 - 115	82.5 $\pm$ 14.0	
• after 3 months	49 - 78	63.8 $\pm$ 8.9	
• after 6 months	35 - 72	50.1 $\pm$ 11.0	
• after 12 months	30 - 60	41.1 $\pm$ 9.3	
Percent Decrease in BMI after			< 0.001
• 3 months	15 - 32	22.3 $\pm$ 5.1	
• 6 months	29 - 49	39.5 $\pm$ 6.3	
• 12 months	42 - 59	50.4 $\pm$ 5.4	



**Figure 1: Mean Percent loss in BMI of study sample according to Time of monitoring.**

**Table 3: Distribution of post-operative complications among study sample.**

Variables	N% 11(100.0)
Gastric Leak	0(0.0)
Gastric Retention	0(0.0)
Intestinal Obstruction	
• Partial Obstruction	5(45.5)
• Normal	6(54.5)
Decreased S. Calcium	
• Decreased	5(45.5)
• Normal	6(54.5)
Abnormal S.Albumin Level	0(0.0)
Hernia	0(0.0)



**Figure 2: Percent improvement in obesity associated medical conditions after surgical intervention.**

**DISCUSSION:**

There was no significant difference in prevalence between men and women at any age. The prevalence of obesity is strongly related to age, adults aged 60 and over were more likely to be obese than younger adults<sup>(11)</sup>. Middle aged people and those of retirement age are the most 'at-risk' groups.<sup>(12)</sup>

most common age group of overweight in our study was 20-30 years ,the difference in results with other researches may be due to difference in life style of our patients or may be duo to small sample study or possibility of low percentage of aged population in Iraq.

BPD surgery is intended for patients who require the most powerful operation available for sustained weight loss. Kim et al noted that historically, patients who undergo this procedure lose more weight than with any other surgical options including LAP-BAND, gastric sleeve, or gastric bypass, He notice excess weight loss of 74% (of wt. that above normal BMI) at one year, 78% at two years, 81% at three years, 84% at four years, and 91% at five years was achieved<sup>(13)</sup>.

In our study we noticed at the end of the first year the mean BMI had decreased into 41.1 kg/m<sup>2</sup> giving rise to an mean decrease of 50.4% from initial BMI.

Buchwald et al, in a recent review of his first 190 DS cases (most performed open), did not show a statistically greater rate of complications in the super-obese patients<sup>(14)</sup>.

Mitchell et al notice that bowel obstruction is the most common complication, seen in approximately 16% of the cases in one series. It is most commonly seen at the proximal anastomosis and often resolves spontaneously with bowel rest. Persistent or worsening symptoms should trigger further evaluation for

assessment of possible distal high-grade small-bowel obstructions that may require surgical intervention<sup>(15)</sup>.

In our work we found that 45.5% of patients had post operative intestinal obstruction (which was partial obstruction)&none of them developed complete obstruction .

Anastomotic leak is the second most common complication, Serra et al reported that it occurs in approximately 5% of patients<sup>(16)</sup>. In one series, the leak was reported to occur along the gastrectomy line in 70% of cases<sup>(15)</sup>. While in our study no patients develop leak,may be the number of our study was less.

Duodenal Switch patients need to take vitamin supplements throughout their life, because of the malabsorptive aspect of the surgery. Otherwise, they can fall seriously ill. Vitamin A deficiency can cause night blindness and Vitamin D deficiency can cause osteoporosis. Regarding malabsorption ,it was found in about 81.8 % of patients post operatively (these results comparable with other results)<sup>(16)</sup>.

In our research we noticed that none of the patients developed gastric leak, gastric retention, hernia, abnormal serum albumin, or pancreatitis & Intestinal obstruction postoperatively was only partial and affected five patients .

In the Buchwald meta-analysis, a review of studies published between 1990 and 2003, it was concluded that BPD/DS resulted in more weight loss, and greater improvement in diabetes, hyperlipidemia, hypercholesterolemia, hypertriglyceridemia, and obstructive sleep apnea syndrome (OSAS) than any other type of bariatric procedure. In our study we noticed good improvement in DM, hypertension &sleep apnea (as comparable with other results)<sup>(27)</sup>.

### COCLUSION:

BPD –DS operation is a good procedure for rapid weight reduction in patients with morbid obesity.

Post operative complications other than malabsorption were low in incidence & self limiting

There is improvement in chronic medical diseases post operatively in one year

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