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Diabetes & its Complications

# Butterfly Gastric Bypass (BB) Single Anastomosis on Butterfly Gastroplasty, New Laparoscopic Technique Evaluation for Morbidly Obese Patients

Essam Abdel –Galil, MD*

*Department of Surgery, Ahmed MAHER Teaching Hospital, Cairo, Egypt.*

*Correspondence:
Essam Abdel-galil, MD, Department of Surgery, Ahmed Maher Teaching Hospital, Tahrir ST, Cairo, Egypt, Tel: +201222180201, Fax: +20233358872; E-mail: essamabdelgalil@esmbs.org.

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## ABSTRACT

***Introduction:*** *The Roux-en y and mini gastric bypass are good operations for morbid obesity- But serious complications and impossible access of traditional endoscopy and ERCP to the bypassed stomach and duodenum and biliary tree are crucial drawbacks.*

*Our new technique (BB) where abanded1cm Outlet is connecting the butterfly gastric pouch with the bypassed stomach and duodenum and allows 25% of the food to pass through the normal pathway which is enough to prevent malabsorptive complications. And allow easy endoscopic and radiological study of the bypassed stomach and duodenum and biliary tree.*

***Methods:*** *From July 2011 through June 2017 laparoscopic BB was attempted in 400 patients with median age 35 and median BMI 45- The butter fly pouch (25 cm) is constructed by using two blue endocartridges 6cm with a mesh (5.5cmx1cm) around 1.2 cm outlet, then the small intestine (150 cm -200 cm from D/J) is anastomosed to the body of the butterfly above the outlet.*

***Result:*** *Mean operating time was 60 minutes. Average weight loss was 70% after one year and 82% & 86% in the second & Third year and 88% & 90% in the fourth year &fifth year respectively. Endoscope was done in 3% of cases for dilatation and three anastomotic ulcers were diagnosed. Dye study showed one fourth of dye passed through the butterfly outlet and three fourth through the anastomosis. Only 10% of cases need supplementation while 90% of cases showed normal levels of vitamins and minerals.*

***Conclusion:*** *BB is one ideal bypass procedure. Weight loss is identical to mini bypass. And only 10% need supplementation. Beside endoscopic and radiological studies are feasible while it is impossible in other types of bypass surgery.*

## Keywords

Butterfly gastroplasty, Bypassed stomach, Endoscopic, Radiological studies, Supplementation.

## Introduction

The Roux-en y and mini gastric bypass are good operations for morbid obesity- But serious malabsorptive complications and impossible access of traditional endoscopy and ERCP to the bypassed stomach and duodenum and biliary tree are cruchial drawbacks.

Perforation, bleeding and malignancy of the bypassed stomach are serious complications and fatal if not early diagnosed, which is an impossible situation in RYGBP and mini bypass.

Our new technique (BB) where a banded 1cm Outlet is connecting

the butterfly gastric pouch with the bypassed stomach and duodenum and allow 25% of the food to pass through the normal pathway which is enough to prevent malabsorptive complications. And allow easy endoscopic and radiological study of the bypassed stomach and duodenum and biliary tree. With weight loss is as similar as other techniques of gastric bypass.

## Patients and Methods

From July 2011 through June, 2017 an attempt was carried out to perform laparoscopic Butterfly gastric bypass (BB) IN 400 Patients. 325 patients were female and 75 were male table 1 show the demographic data of the patients. The median age was 35 and medium BMI was 45 kg/m$^2$. The position of the patient and trocars are similar to any hiatal procedure. The anterior and posterior layers of the gastrosplenic ligament are divided from the level of splenic vessels up to angle of His. The first articulating endocutter (blue 60) in applied from the angle of His downward with complete exclusion of the gastric fundus. AT the level of the first branch of the left gastric artery, the retro gastric space is completely dissected and the second endocutter cartridge (blue 60) is applied to perform the butterfly pouch (25 cm funnel –shaped) with accurate adjustment of the pouch outlet (1.2 cm) which is banded with a mesh (5.5cmx1cm), this outlet allow gastro – gastric continuation, and thus availability of endoscopic and radiological study of the bypassed stomach, duodenum and biliary tree. Single anastomosis is then done between the butterfly pouch and small intestine (150cm-200cm from the D/J junction) above the butterfly outlet. Dye study using gastrografin only in the first weak , and mixed jelly was done one weak, 6 months and one year postoperatively and showed that one fourth (25%) of the food pass through the butterfly outlet (the normal pathway) and 75% pass through the gastro-enteric anastomosis. Serum level of sodium, potassium, calcium, protein, albumin, iron, Ghrelin and B12 was done four times in the first year then two times every year.

| Demographics | Data |
|---|---|
| Number | 400 |
| Age | 35 (20-50) |
| Sex (F/M) | 325/75 |
| BMI (KG/M$^2$) | 45 (40-60) |
| Weight(kg) | 115-209 |

**Table 1:** Demographic Data.

## Results

The operation time ranged between 45 minutes and two hours with mean time 60 minutes. One case has to be converted to open surgery due to splenic injury and splenectomy was done. There were no mortality's. There was 8 cases of postoperative leak (2%) all treated with leak site suturing and converting the bypass to Roux-en-y type and abdominal drainage. All leak sites were at anastomosis site. There was one case of adenocarcinoma (1st) at the prepyloric area in a male patient, two and half years postoperative discovered by endoscopic biopsy after recurrent attacks of intolerable pain. There were 8 cases of biliary duct stones (2%) & ERCP solved the problem.

Average excess weight loss was 70% after one year, 82% in second year, 86% in third year and 88% in the fourth year and 90% in the fifth year. Endoscopic dilatation of the anastomotic stoma was done in 12 cases (3%) and three anastomotic ulcers were diagnosed & healed conservatively. 360 cases (90%) show normal levels of serum vitamins electrolytes and proteins. And need no supplementation. 40 cases (10%) show fluctuant levels (especially albumin, potassium and calcium) and need supplementation for the first two years. Only one case of these 10% responded only after dismantling the anastomosis.

There was complete cure of diabetes type 2 in 93% of cases (it ranges between 88% and 96% in other studies), and 98% of cases showed cure of hypertension (nearly same results in other studies).

Problems of infertility solved in 88% of cases and there was marked decrease of Ghrelin level in all cases. There was no mortality (Tables 2 and 3).

| Demographics | Results |
|---|---|
| Mean Operating Time in Non complicated Cases | 45 minutes |
| Mean Operating Time in complicated Cases | 72 minutes |
| Mean Operating Time | 60 minutes |
| Internal Hemorrhage | 3 Cases |
| Conversion to Open Surgery | 1 Case |
| Leak | 8 cases (2%) |
| Intolerance to solid Food | 10% |
| Weight Look | See NEXT Table |
| Mortality | 0% |

| Mean% excess weight loss | Period |
|---|---|
| 70% | 1 year |
| 82% | 2 years |
| 86% | 3 years |
| 88% | 4 years |
| 90% | 5 years |

**Tables 2 and 3:** Results.

## Discussion

The success of butterfly gasrroplasty as a Laparoscopic restrictive procedure, as more than 5000 cases have done (after 2008) in many centers and Ahmed Maher teaching hospital Cairo Egypt. This success was followed by anastomosis of the small intestine (150-200 cm from D/J) to the butterfly pouch.

In an entry of food through the Funnel shaped butterfly micro pouch with outlet in the same axis with food descent, through single anastomosis above the outlet away from the magenstrasse, explain why only 75% of food passes through the anastomosis and not 100%as if RYGBP is done by open technique on a traditional VBG. A situation documented with Gastrografin-jelly mix given orally during multiclice C-T Scan studies.

Weight less in this study was nearly the same as in butterfly

gastroplasty alone and even the same as in the traditional mini bypass where the gastric pouch is completely separated from the rest of the stomach with no gastro gastric continuation. The explanation in both technique depend on the fact that all types of proximal gastric bypass act as mainly as a restrictive procedure and to a lesser extent as a malabsortive procedure.

Although the occurrence of gastric carcinoma in obese patients is not frequent but it has the same incidence. The gastric continuation though a banded outlet (1.2 cm) allow the endoscope to diagnose and take biopsy of the suspected areas of the bypassed stomach which is impossible in any other types of gastric bypass.

In our study there was one case of prepyloric adenocarcinoma diagnosed and treated. ERCP have been used in 8 cases of CBD tones (2%) passing through the gastric gastric outlet. A situation not feasible in any other technique of gastric bypass. Passage of 25% of food through the normal pathway in addition to the fact that proximal gastric bypass is not a totally malabsorptive procedure help 90% of any cases to have no regular post-operative supplementation, and biochemical studies showed that only 10% of cases need supplementation only in the first two years as huge dilatation of the intestine from the anastomosis down to the caecum preclude completely any malabsorption. Incidence of leak, anastomotic ulcer and stoma stenosis is nearly similar to other studies of the traditional technique.

There was complete cure of diabetes type 2 in 92% of cases (it ranges between 88% and 94% in other studies), and 98% of cases showed cure of hypertension (nearly same results in other studies). Problems of infertility solved in 88% of cases and there was marked decrease of Ghrelin level in 95% of cases. We recommend laparoscopic butterfly gastric bypass (BB) to be the technique of choice in morbid obesity as it has all the advantages of mini gastric bypass in addition to the gastro-gastric banded outlet allows easily the endoscopic and radiological diagnosis treatment of the bypassed stomach, duodenum and biliary tree.

Passage of only 75% of food through the gastro-intestinal anastomosis and 25% by the normal pathway through the butterfly outlet help 90% of cases to have no supplementation.

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