Effect of Laparoscopic Mini Gastric Bypass Surgery on Morbidly Obese Patients with Special Reference to Diabetes Mellitus and Associated Comorbidities

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ABSTRACT

BACKGROUND
Morbid obesity is a serious health condition that can interfere with basic physical functions such as breathing or walking. Those who are morbidly obese are at greater risk for illnesses including diabetes, high blood pressure, sleep apnoea, gastro oesophageal reflux disease (GERD), gallstones, osteoarthritis, heart disease, and cancer. Obesity is pandemic with more than 1.5 billion overweight adults. There is a growing body of evidence showing that the Mini-Gastric Bypass (MGB) is a safe and effective alternative to other bariatric surgical operations.

METHODS
This study was carried on 30 patients affected with obesity with body mass index (BMI) of 40 Kg/m² or greater, or obese patients with BMI > 35 Kg/m² with obesity-related comorbid conditions like diabetes mellitus, hypertension, dyslipidaemia undergoing laparoscopic MGB. Cases were selected from the patients attending OPD of the institution.

RESULTS
Although several treatments, including dieting, exercise, and medication are effective for obesity, bariatric surgery has demonstrated better long-term effects and is the first choice for severe morbid obesity. In the present study, 30 obese patients who underwent mini gastric bypass surgery were followed up for 6 months’ time period to evaluate the proportion of weight loss, effect on diabetes, hypertension, dyslipidaemia, thyroid stimulating hormone (TSH) levels. Following surgery, at 6 months follow up, the effective weight loss was 54% with a p value of <0.0001 (<0.05), mean reduction in BMI after 6 months was 11.5 Kg/m², remission of diabetes in 70% of the diabetic patients with improvement in rest of the cases. There was an overall improvement of hypertension in almost all cases, the value of total cholesterol showed remission in 81.82% of the cases with p value of <0.0001 which was statistically significant.

CONCLUSIONS
Morbid obesity is more common in females. Most common co-morbid conditions associated with morbid obesity are diabetes mellitus, hypertension and dyslipidaemia. Surgery is the best treatment for morbid obesity. There were no major complications/side effects associated with the procedure. Two of the patients had bleeding per rectum post operatively which was improved subsequently. Most of the patients developed nausea and dyspepsia post operatively which were relieved by medication.

KEY WORDS
Laparoscopic Mini Gastric Bypass (LMGB), Morbid Obesity, Comorbidities, BMI

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An individual is considered morbidly obese if he or she is 100 pounds over his/her ideal body weight, has a body mass index (BMI) of 40 or more, or 35 or more and is experiencing obesity-related health conditions, such as high blood pressure or diabetes.\(^1\) It is not a disease of known cause, but several factors are involved in its formation. Genetic factors,\(^2\) biochemical,\(^3\) psychological factors,\(^4\) and environmental factors\(^5\) play important roles in causing obesity. Energy imbalance is the most important factor in weight gain and obesity.\(^6\) Morbid obesity is a serious health condition that can interfere with basic physical functions such as breathing or walking. Those who are morbidly obese are at greater risk for illnesses including diabetes, high blood pressure, sleep apnea, gastro esophageal reflux disease (GERD), gallstones, osteoarthritis, heart disease, and cancer. Obesity is a worldwide epidemic with more than 1.5 billion overweight adults.\(^6\) Overweight and obesity remains a major health challenge and are considered to be the fifth leading risk for global death and a major burden on health care systems. Increased health risks of obesity have been documented for centuries in Charaka Samhita\(^9\) and writings attributed to Hippocrates\(^10\). Such observations are no less relevant now. Obesity is not only a burden per se but is also tightly connected to diabetes and cardiovascular diseases and many other diseases.\(^1\)\(^,\)\(^12\)

Mini-Gastric Bypass (MGB or Malabsorptive Gastric Bypass) was devised by Robert Rutledge in USA in 1997. As a trauma surgeon, he was faced with an abdominal gunshot wound where a duodenal exclusion with a Billroth II anastomosis was an appropriate reconstruction. This was the inspiration that led Rutledge to the MGB on consenting bariatric patients, constructing a lesser curvature wound where a duodenal exclusion with a Billroth II anastomosis was an appropriate reconstruction. This was the inspiration that led Rutledge to the MGB on consenting bariatric patients, constructing a lesser curvature channel which prevents reflux.\(^1\)\(^,\)\(^3\)\(^,\)\(^1\)\(^4\)

We wanted to evaluate the effect of mini gastric bypass surgery in morbid obesity in terms of decrease in BMI, improvement in diabetes mellitus, surgery related complication and associated comorbidities like joint pain and dyslipidaemia.

Methods

Ethical committee clearance was taken, and patients were explained about pros and cons of LMBG in the language patient understands. The study was a observational study. This study was carried on 30 patients affected with obesity with BMI of 40 Kg/m\(^2\) or greater, or patient with BMI > 35 Kg/m\(^2\) with obesity-related comorbid conditions like diabetes mellitus, hypertension, dyslipidaemia undergoing laparoscopic MGB.\(^1\)\(^5\)\(^,\)\(^1\)\(^6\)\(^,\)\(^1\)\(^7\)\(^,\)\(^1\)\(^8\) These patients were selected from OPD of the institution.

All these patients were thoroughly evaluated irrespective of their cast, religion, and socio-economic status. Written informed consent was obtained from patients. Postoperative, patients were followed up at 1 month, 3 months and 6 months and monitored for weight, BMI, diabetes status, hypertension, and dyslipidaemia. Patients were also evaluated for any delayed complication following surgery. Patients who have failed on conventional and medical therapy.

Inclusion Criteria
1. Acceptable operative risk.
2. Failure of non-surgical weight loss programs/ failed dietary therapy.
3. Psychologically stable with realistic expectations.
5. Supportive family/social environment.
6. Absence of active alcohol or substance abuse.

Exclusion Criteria
1. Age less than 18 years and more than 65 years.
2. All the patients with inadequate follow up (drop out/deaths).
3. Pregnancy and lactation at screening or surgery.
4. Documented history of drug or alcohol abuse.
5. Previous restrictive or malabsorptive procedure performed for the treatment of obesity.
6. Additional exclusion criteria include:
   a. Acute or chronic upper gastrointestinal conditions (Gastric/Oesophageal Varices or GERD)
   b. Congenital and acquired anomalies of the gastrointestinal tract.
   c. Severe cardiopulmonary disease, advanced liver disease with portal hypertension etc. making the subject a high-risk surgical candidate.
   d. Previous surgery of forget (Previous Gastric Surgery or Hiatal Hernia Repair)
   e. Pancreatitis or immunocompromised status.
   f. Psychiatric patients that limits the patient’s ability to understand the procedure and thus precludes informed consent.
   g. History of eating disorders such as bulimia.
   h. Patients with Prader-Willi-Syndrome.

Observations

Postoperative, patients were followed-up at 1 month, 3 months and 6 months and monitored for weight, BMI, diabetes status, hypertension, and dyslipidaemia. Patients were also evaluated for any delayed complication following surgery. Patients who have failed on conventional and medical therapy.
All surgeries were successfully completed laparoscopically with no intra or significant post-operative complication or mortality. Minor episodes of vomiting were present in most of the patients which improved subsequently on treatment. Following surgery, at 6 months follow up the effective weight loss was 54% and was statistically significant with p value of <0.0001 (<0.05). The mean reduction in BMI was 11.5 Kg/m² and was statistically significant. There was remission of diabetes in 70% of the diabetic patients. With improvement in rest of the diabetic cases, though statistically not significant. The FBS came within normal range for most at 6 months follow up, there was overall improvement of hypertension in almost all cases. Changes in the value of total cholesterol was evaluated, those laboratory values return to normal were considered remission. The study showed remission in 81.82% of the cases at the end of 6 months.

**Table 1. Age and Sex Distribution**

<table>
<thead>
<tr>
<th>Age Group (Years)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 30</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>31-40</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>41-50</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>51-60</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>37.3±8.33</td>
<td>37.47±7.89</td>
</tr>
</tbody>
</table>

**Table 2. Sex Wise Distribution of Cases according to Characteristics at 0 Month**

<table>
<thead>
<tr>
<th>Comorbidities</th>
<th>DM</th>
<th>HTN</th>
<th>Dyslipidaemia</th>
<th>TSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>6</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Percent</td>
<td>33.3%</td>
<td>30%</td>
<td>36.6%</td>
<td>10%</td>
</tr>
</tbody>
</table>

**CONCLUSIONS**

Morbid obesity is more common in females. Most common co-morbid conditions associated with morbid obesity are diabetes mellitus, hypertension and dyslipidaemia. Surgery is the best treatment for morbid obesity. There were no major complications/side effects associated with the procedure. Most common complication after surgery was nausea and dyspepsia which was relieved by medication.

**REFERENCES**


