Vertical Banded Gastroplasty for Morbid Obesity

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Obesity is a common health problem in Saudi Arabia. Morbid obesity is associated with various psychological and medical problems. Gastric restrictive surgery, gastric bypass and vertical banded gastroplasty (VBG) are accepted as the surgical procedures of choice for the treatment of the morbidly obese patients. Between November 1987 and November 1990, 61 patients; 34 males and 27 females underwent VBG with no mortalities and minor morbidity. Thirty-four patients completed 1 year after their surgery, at 1 year their percent ideal weight dropped from 231.84 to 132.30 (p < 0.001) and body mass index from 50.16 to 33.80 (p < 0.0001). Their average excess weight loss was 59.21 kg.

Morbid obesity is a serious health hazard with various psychological and medical problems, contributing to a shortened lifespan. Few morbidly obese patients achieve and maintain weight loss using dietary or behavioural therapy. Non-surgical methods that use mobile incarceration (jaw wiring and endoscopically inserted gastric balloons) are unrewarding in producing long-lasting weight loss. Although jejunoileal bypass produced satisfactory weight loss, the metabolic consequences were considerable, therefore it has now been largely abandoned in favour of gastric restrictive operations.

Various gastric restrictive procedures have been described. Of them only two; gastric bypass and vertical banded gastroplasty proved to be effective in producing and maintaining long-lasting weight loss.

Patients and Methods

In a prospective fashion, patients who underwent vertical banded gastroplasty in King Abdulaziz University Hospital in Jeddah between 1987 and November 1990 were enrolled in this study. There were 61 patients, 34 were males and 27 were females.

Ideal weight tables are not available for the population of Saudi Arabia, so we used the 1983 Metropolitan height and weight tables to calculate the excess weight by assuming that ideal weight is the average weight of a medium frame individual for the height. Using the Quetelet Body Mass Index (BMI) which is calculated by dividing the body weight in kilograms by the square of the height in meters minimizes the dependence on height.
and allows for comparison between populations. The BMI could be related to the degree of obesity which makes its clinical application meaningful to patients and practitioners23 (Table 1).

The health problems associated with obesity become significant when body weight exceeds 20% above ideal weight.24 Patients were considered to have medically significant obesity and were considered for surgery if they exceeded 160% of their ideal weight or BMI of 35 kg/m². Our selection criteria included patients over 18 years and less than 50 years old, who had no previous abdominal surgery for obesity and who had failed to lose weight following strict dietary control.

All patients were interviewed by dieticians and were supplied with an information booklet about the operation and what to do before and after surgery. A vertical banded gastroplasty was performed on all patients as described by Mason.25

All patients were encouraged to get out of bed on the day of the operation. Clear fluids were given on the first postoperative day, advanced to a blended diet over a few days and converted to solid food at 6 weeks.

Percentage excess body weight was used to measure the weight loss postoperatively, (calculated by subtracting 100 from the percentage ideal weight). This method was recommended by a consensus of the American Society of Bariatric Surgeons for expressing the results of obesity surgery.26

### Table 1

**Obesity classification in relation to percentage of ideal weight and body mass index (BMI)**

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th></th>
<th>Women</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Ideal weight</td>
<td>BMI</td>
<td>% Ideal weight</td>
<td>BMI</td>
</tr>
<tr>
<td>Super obese</td>
<td>225</td>
<td>50</td>
<td>245</td>
<td>50</td>
</tr>
<tr>
<td>Morbid obese</td>
<td>200</td>
<td>45</td>
<td>220</td>
<td>45</td>
</tr>
<tr>
<td>Medically significantly obese</td>
<td>160</td>
<td>35</td>
<td>170</td>
<td>35</td>
</tr>
<tr>
<td>Obese</td>
<td>135</td>
<td>30</td>
<td>145</td>
<td>30</td>
</tr>
<tr>
<td>Ideal weight</td>
<td>100</td>
<td>22</td>
<td>100</td>
<td>21</td>
</tr>
</tbody>
</table>

BMI = body mass index = \( \frac{\text{Weight (kg)}}{\text{square of height (m)}} \)

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**Statistical analysis**

The significance level for all analysis was chosen to be \( p = 0.05 \). Analyses were conducted using the SPSS statistical package.

**Results**

All 61 patients either attended follow-up clinic regularly, or were contacted at home or work for interviews. Only one patient who was a resident in another city was lost for follow-up.

There were 34 (55.74%) males and 27 (44.26%) females. The mean age was 25 ± 5.95 years for males and 29.26 ± 6.38 years for females.

The mean preoperative weight in males was 150.33 (± 25.43) kg and in females was 127.85 (± 25.85) kg whilst the body mass index was 50.07 (± 6.99) in males and 50.27 (± 9.93) in females. The percentage of ideal weight (preoperative weight/ideal weight x 100) was 221.39 (± 29.28) in males and 245:02 (± 46.22) in females.

There were no early or late deaths in this study. Six patients had early postoperative complications including four respiratory infections, one wound infection and one wound seroma. Two patients had late complications including stomal stenosis and severe nutritional problems leading to temporary difficulty in walking.

Of the total 61 patients 34 (55.74%) had their data analysed 1 year after surgery. Their mean percentage ideal weight was 220.97 for males with BMI 50.41 and was 231:41 for females with BMI 47.47; 17 (50%) patients were super-obese. There was no significant difference between males and females.

One year after surgery 23 (67.5%) patients had lost 50% or more of their excess weight.

The percentage ideal weight for male patients dropped significantly from 220.97 to 147.78 (p < 0.001) and BMI from 50.41 to 33.68 (p < 0.001) while in female patients their percent ideal weight dropped from 231.41 to 166.32 (p < 0.001) and BMI fell from 47.47 to 34.14 (p < 0.001).

Table 2 shows that the percent ideal weight dropped significantly for all patients from 231.84 to 152.30 (p < 0.001) and BMI from 50.16 to 33.8 (p < 0.001).

**Discussion**

In a study from the eastern province of the Kingdom of Saudi Arabia marked obesity (BMI > 30) was found in 16.5% of males and 31.26% of females. Overall marked obesity was

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**Table 2**

<table>
<thead>
<tr>
<th>Obesity status</th>
<th>Preoperative</th>
<th>1 Year after surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Ideal weight</td>
<td>BMI</td>
</tr>
<tr>
<td>Super Obese</td>
<td>17 260.94</td>
<td>57.28</td>
</tr>
<tr>
<td>Morbid Obese</td>
<td>7 222.8</td>
<td>47.84</td>
</tr>
<tr>
<td>Medically significant obesity</td>
<td>9 198.5</td>
<td>42.28</td>
</tr>
<tr>
<td>Obese</td>
<td>1 182</td>
<td>34.67</td>
</tr>
<tr>
<td>Total</td>
<td>34 231.84</td>
<td>50.16</td>
</tr>
</tbody>
</table>

BMI as defined in Table 1
found in 24.72% of the adult population. This is considerably higher than what has been cited for marked obesity in the UK and USA which is 4.05% of adults of both sexes. In another study from the same eastern area, marked obesity was found to be 27% in non-pregnant Saudi women aged 15–49 years.

Although gastric restrictive operations (gastric bypass and vertical banded gastroplasty) are accepted as the standard treatment for morbid obesity, debate still exists as to which of them is the procedure of choice. The Adelaide study and Sugerman et al. in their prospective trials reported excess weight loss with vertical banded gastroplasty (VBG) of 48% at 3 years and 43 ± 18% at 1 year respectively. This less favourable weight loss is difficult to understand as weight loss with VBG in other reported series was superior at 1 year (61 ± 23 and 68 ± 21% respectively) and was 63% at 2 years with vertical silastic ring gastroplasty. The average excess weight loss in our series at 1 year was 59.21 kg.

Even if the weight loss is superior with Roux-Y gastric bypass, this is done at the expense of more complications such as stomal stenosis up to 25%, marginal ulcers up to 10%, iron deficiency anaemia and vitamin B12 deficiency. The difficulty in examining the distal excluded part of stomach with Roux-Y bypass for diagnostic or therapeutic purposes should also be considered.

The difference in weight loss after the same procedure in different reports may well reflect the difference in eating habits in different societies.

References
29. Mason EE, Lewis J, Doherty C, Rodriguez EN, Scott DH, Blommers TJ. Vertical banded gastroplasty for...

