Effect of Bariatric Sleeve Gastrectomy Technique on Women's Lower Urinary Tract Symptoms and Quality of Life: A Prospective Study

Bariatrik Sleeve Gastrektomi Tekniğinin Kadın Alt Üriner Sistem Semptomları ve Yaşam Kalitesi Üzerine Etkisi: Prospektif Bir Çalışma

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ABSTRACT

Objective
Obesity triggers lower urinary tract symptoms (LUTS) secondary to accumulation of excess fat which may lead to increase in intra-abdominal/intravesical pressures and subsequent impairment in pelvic floor muscles. However, it is considered that weight loss resolve these symptoms. In this study, we aimed to investigate the effects of bariatric surgery and especially Sleeve gastrectomy (SG) on women's LUTS, and quality of life.

Materials and Methods
A total of 53 patients who have undergone laparoscopic SG in our clinics between April 2014 and March 2015 were included in this prospective study. Age, body weight and body mass index (BMI) of the participants were preoperatively and postoperatively recorded. The patients have pre/post-operatively filled the Beck depression inventory (BDI), International prostate symptom score (IPSS), International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) and the 36-Item Short Form health survey (SF-36) scores were recorded. Additionally, post-operative decrease in body weight and BMI of the patients was recorded.

Results
There was a statistically significant decrease in mean BDI, IPSS and ICIQ-SF scores and SF-36 (prominent increment in physical and mental

What's known on the subject? and What does the study add?
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Introduction

Obesity is among the most important problems both in developed and developing countries due to its related comorbidities. From the year 1980 up to now, the number of obese individuals has increased nearly two-fold. Based on 2008 data of The World Health Organization, 1.6 billion overweight adults are living worldwide. This figure also includes 300 million obese female individuals (1,2).

In the United States, approximately 67% of the population is either overweight or obese, whereas the prevalence of obesity is 40-50% in many European countries (3). More than 40 million children under five years of age were overweight according to 2011 data (1,2). It is estimated that there are 500 million obese adults globally and this number is increasing every year. Annually, nearly 2.8 million people are lost because of the complications related to obesity (4). The Turkish Diabetes Epidemiology Study-I (TURDEP-I), reported that the prevalence of obesity was 22.3% in 1997 (5). However, it has been reported in TURDEP-II that the obesity rate raised up to 32% in 2010 and this fact reflects a worrisome increment (6).

Obesity is a major contributor to the development of comorbidities such as cardiovascular disease, hypertension, diabetes mellitus, respiratory tract diseases (e.g. chronic obstructive pulmonary disease) and a neurological disorder which might be associated with urinary symptoms, and those younger than 18 years of age were excluded. 53 female patients were included in this study and pre- and post-operative data were evaluated. Preoperative data on age, height, body weight and body mass index (BMI) were recorded. Before and after the operation (6 months after surgery) the patients completed the International prostate symptom score (IPSS), International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF), Beck depression inventory (BDI) and the 36-Item Short Form health survey (SF-36), and the scores were recorded. Besides, postoperative decrease in body weight and BMI were determined in all patients. All the participant patients were advised to follow the dietary program according to the bariatric surgery diet guidelines for six months before and after the surgical intervention and to avoid some foods, such as caffeine, spices and citrus fruits which may cause irritation in the bladder.

Materials and Methods

A total of 53 female obese patients who underwent LSG between April 2014 and March 2015 were included in this prospective study. Ethical approval was obtained from the Local Ethics Committee prior to commencing the study. Patients who did not give informed consent, those with a history of treatment for sexual dysfunction, with a known mental or psychiatric disease, a history of weight loss treatment, surgery for incontinence, medical treatment for LUTS, or a neurological disorder which might be associated with urinary symptoms, and those younger than 18 years of age were excluded.

Sleeve gastrectomy (LSG) is one of the most frequently preferred term (8). When mortality, morbidity, cost, patient’s satisfaction and, most importantly, amount of weight loss are considered, laparoscopic surgery has become the first choice in the treatment of morbid obesity (7).

Obesity, lower urinary system, bariatric surgery, Sleeve gastrectomy, quality of life

Conclusion

Negative effect of obesity on LUTS and quality of life cannot be ignored. We assume that bariatric surgery can induce dramatic weight loss, amelioration in symptoms of urinary dysfunction and increase in quality of life of women.

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IPSS: Its former name was American Urological Association Symptom Index. This scoring system consists of 8 items, which are rated as mild (0–7), moderate (8–19) and severe (20–35) symptomatic. Severity of symptoms and their progression within a specific time period are compared.

ICIQ-SF: This scoring system measures severity and effects of symptoms of incontinence on quality of life and contains 4 questions. The cut-off scores are as follows: slight=1–5, moderate=6–12, severe=13–18 and very severe=19–21.

BDI: It is a multiple-choice self-assessment scale consisting of 21 items used to measure severity of anxiety in children and adults. The levels of anxiety are scored as follows: 0–13= minimal depression, 14–19=mild depression and 20–28=moderate depression, 20–63=severe depression.

Conclusion

Negative effect of obesity on LUTS and quality of life cannot be ignored. We assume that bariatric surgery can induce dramatic weight loss, amelioration in symptoms of urinary dysfunction and increase in quality of life of women.

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SF-36: This is a reliable and very frequently used validated scale in the evaluation of health status and quality of life. The scale consists of 36 items and enables measurements of 8 domains which include vitality, physical functioning, bodily pain, general health perceptions, physical role functioning, emotional role functioning, social role functioning, and mental health. Scoring is summarized under two headings namely Physical summary scores (PCS) and Mental summary scores (MCS).

Surgical technique: SG was firstly started to be performed as a restrictive component of duodenal switch operation. It was introduced into surgical practice as a risk-decreasing method in high-risk patients who cannot tolerate prolonged procedures (15). LSG has become a safe and effective primary method of bariatric surgery, which has gained high popularity among surgeons and patients (16). In this method, a narrow tubular neo-stomach is constructed. Greater curvature is freed from 2-3 cm proximal to the pylori up to “His angle” (incisuracardiaca), then gastric resection is realized. In order not to leave a large fundus pouch behind, posterior dissection should be very well performed so as to make His angle visible. Sleeve tube is fixated by suturing it to the omentum or gastrocolic adipose tissue. This procedure prevents kinking of the stomach from incisura angularis. Restrictive nature of LSG, decrease in ghrelin hormone production, rapid passage of food into distal segments and increase in peptide-YY and glucagone-like peptide-1 hormones are thought to induce weight loss (17,18). LSG is preferred in super obese patients, and those with a BMI of <50 kg/m² who want to be operated with this method.

Postoperative changes in some postoperative parameters of female patients

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Preoperative Mean±SD (median)</th>
<th>Postoperative Mean±SD (median)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI (kg/m²)²</td>
<td>47.39±6.4</td>
<td>37.76±5.14</td>
<td>0.0012</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>126.64±17.69</td>
<td>100.17±12.98</td>
<td>0.0012</td>
</tr>
<tr>
<td>IPSS⁴</td>
<td>14.66±4.67 (15)</td>
<td>9.15±2.81 (8)</td>
<td>0.0012</td>
</tr>
<tr>
<td>ICIQ-SF⁵</td>
<td>5.64±4.99 (6)</td>
<td>2.34±2.92 (1)</td>
<td>0.001**</td>
</tr>
<tr>
<td>PCS⁶</td>
<td>36.72±9.96</td>
<td>45.01±6.01</td>
<td>0.0012</td>
</tr>
<tr>
<td>MCS⁷</td>
<td>44.36±6.63</td>
<td>49.7±4.82</td>
<td>0.0012</td>
</tr>
</tbody>
</table>

Discussion

Theoretically, obesity triggers LUTS due to accumulation of excess fat which causes increases in intraabdominal and intravesical pressure the preoperative estimates (for all, p=0.001). When compared with preoperative values, statistically significant increases were observed in average postoperative PCS and MCS (for all, p=0.001) (Table 2). When compared with preoperative values, a positive correlation at a level of 29.5% was found between postoperative amount of percent change in BMIs and age (p=0.032). When compared with preoperative values, there was no statistically significant correlation between postoperative amount of percent change in BMIs, and changes in ICIQ-SF, PCS and MCS values (p=0.054). When compared with preoperative values, a statistically significant positive correlation was observed at a level of 27.8% between postoperative amount percent change in BMIs, and changes in BDI scores (p=0.044). When compared with preoperative values, a statistically significant positive correlation was found at a level of 33.5% between postoperative amount of percent change in BMIs and changes in IPSS values (p=0.014) (Figure 1).

Table 2. Evaluation of percent changes detected in postoperative Body mass index values relative to preoperative values and their correlations with changes in some selected parameters

<table>
<thead>
<tr>
<th>Postoperative changes in some postoperative parameters relative to preoperative values</th>
<th>BMI² percent change (%)</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>0.295</td>
<td>0.032*</td>
<td></td>
</tr>
<tr>
<td>BDI³</td>
<td>0.278</td>
<td>0.044*</td>
<td></td>
</tr>
<tr>
<td>IPSS⁴</td>
<td>0.335</td>
<td>0.014*</td>
<td></td>
</tr>
<tr>
<td>ICIQ-SF⁵</td>
<td>0.266</td>
<td>0.054</td>
<td></td>
</tr>
<tr>
<td>Body weight</td>
<td>0.859</td>
<td>0.001**</td>
<td></td>
</tr>
<tr>
<td>PCS⁶</td>
<td>-0.244</td>
<td>0.078</td>
<td></td>
</tr>
<tr>
<td>MCS⁷</td>
<td>-0.266</td>
<td>0.055</td>
<td></td>
</tr>
</tbody>
</table>

Pearson correlation analysis *p<0.05, **p<0.01, SD: Standard deviation, ²Wilcoxon signed-rank test, ³Paired samples t test, ⁴p<0.001, ⁵BMI: Body mass index, ⁶BDI: Beck depression inventory, ⁷IPSS: International prostate symptom score, ⁸ICIQ-SF: International Consultation on Incontinence Questionnaire-Short Form, ⁹PCS: Physical summation score, ¹⁰MCS: Mental summation score
lower than the average scores detected in normal population. Whereas, postoperative PCS and MCS statistically significantly improved, and raised to 45.01 and 49.7 points, respectively.

IPSS rating scale was not used in LUTS evaluation in the current study. However, it has also been reported in the literature that IPSS, which was a well-known approach in evaluation of the male patients, was used in female patients. In our study, IPSS rating scale was applied for LUTS of our patients and, after assessments, the patients were categorized in the mildly symptomatic (0–7) group. However, when compared with the preoperative values, the decrease in postoperative mean IPSS scores was statistically significant. Besides, a statistically significant and positive correlation at a level of 33.5% was found between amount of percent change in BMI and changes in IPSS scores. In our study in female patients who had undergone LSG and lost weight, LUTS ameliorated with resultant improvement in patients quality of life.

In the future, studies incorporated with urodynamic studies, which will explain postoperative improvements in LUTS following bariatric surgery, and relevant correlations should be conducted.

Unfavorable effects of increasingly prevalent obesity on sexual functions cannot be denied. We assume that bariatric surgery induces dramatic weight loss, and also decreases urinary dysfunction in women with resultant improvement in their quality of life.

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Ethics
Ethics Committee Approval: 2014/16 study, Fatih Sultan Mehmet Training and Research Hospital–Local Ethics Committee 2014/36, Informed Consent: Consent form was filled out by all participants.

Authorship Contributions

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References


