

Hyoscine-Butylbromide Used During Laparoscopic Sleeve Gastrectomy Increases Removed Gastric Volume

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ABSTRACT

Aim: Obesity is one of the most common diseases, The main goal in bariatric surgeries is to reduce the gastric volume. Also, studies have linked reduced abdominal volume and weight loss. Our aim in this study is to investigate intraoperatively administered hyoscine butylbromide(HBB) on the removed gastric volume(RGV).

Material and Methods: The study, which was planned as a retrospective cohort study, included 67 patients who underwent laparoscopic sleeve gastrectomy (LSG). HBB at a dose of 20 mg was given to 32 patients preoperatively(Group II). A similar procedure was applied to 35 patients in the control group(Group I), but HBB was not given. Demographic characteristics, body mass indexes, and laboratory values of the patients were recorded. Weight loss and changes in BMI were recorded at the first and sixth month controls. Data were analyzed for normality of distribution with the Shapiro-Wilk test. Non-parametric values for general differences between groups were analyzed with the Mann-Whitney U test and parametric values were analyzed with Student t-test .

Results: In Group II, the removed gastric volume was greater. In the first and sixth month BMI, there was a significant difference between the groups. Group II lost more weight statistically, and as a result, their BMI decreased significantly.

Conclusion: It was observed that inexpensive and easily accessible HBB increased the removed gastric volume in bariatric surgery and contributed to weight loss.

Keywords: Sleeve, Gastrectomy, Hyoscine butylbromide, Gastric volume

Laparoskopik Sleeve Gastrektomi Sırasında Kullanılan Hyoscine-Butylbromide, Çıkarılan Mide Hacmini Artırır

ÖZ

Amaç: Obezite en sık görülen hastalıklardan biridir. Obezite ameliyatlarında temel amaç mide hacmini azaltmaktır. Ayrıca çalışmalar, karın hacminin azalması ve kilo kaybını ilişkilendirmiştir. Bu çalışmada amacımız, intraoperatif uygulanan hyoscine butylbromide(HBB)'in çıkarılan mide hacmi üzerine etkisinin araştırılmasıdır.

Gereç ve Yöntemler: Retrospektif kohort çalışması olarak planlanan çalışmaya laparoskopik sleeve gastrektomi (LSG) uygulanan 67 hasta dahil edildi. Ameliyat öncesi 32 hastaya 20 mg HBB verildi(grup II). Kontrol grubundaki 35 hastaya benzer bir işlem uygulandı ancak HBB verilmedi(grup I). Hastaların demografik özellikleri, vücut kütle indeksleri ve laboratuvar değerleri kaydedildi. Kilo kaybı ve vücut kütle indeksleri (VKİ)'ndeki değişiklikler birinci ve altıncı ay kontrollerinde kaydedildi. Veriler, Shapiro-Wilk testi ile dağılımın normalliği için analiz edildi. Gruplar arasında genel farklılıklar, parametrik olmayan değerler için Mann-Whitney U testi ile, parametrik değerler ise Student-t testi ile analiz edildi.

Bulgular: Grup II'de çıkarılan mide hacmi daha fazlaydı. Birinci ve altıncı ay VKİ 'lerinde gruplar arasında anlamlı fark vardı. Grup II, istatistiksel olarak daha fazla kilo verdi ve sonuç olarak VKİ'leri önemli ölçüde azalmıştı.

Sonuç: Ucuz ve kolay ulaşılabilir HBB'nin obezite cerrahisinde çıkarılan mide hacmini arttırdığı ve kilo kaybına katkı sağladığı görüldü.

Anahtar Sözcükler: Sleeve, Gastrektomi, Hiyosin butilbromid, Mide hacmi

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INTRODUCTION

Laparoscopic sleeve gastrectomy (LSG) is a frequently used method in the treatment of obesity, which is one of the problems of our time. As obesity continues to increase, the number of patients with existing medical problems (e.g., diabetes, hypertension, and sleep apnea) also increases (1). LSG was first described in 1993 (2). LSG, which started as the first stage of Roux-n y Gastric by-pass and other bariatric surgeries, was later applied as the primary methods (3,4). Because most of the ghrelin hormone is secreted from the fundus of the stomach, LSG provides a physiological advantage over other weight loss methods (5).

During the interventional and surgical procedures performed in the gastrointestinal system (GIS), which is mainly composed of smooth muscles, it is possible to encounter smooth muscle contractions. Hyoscine butylbromide (HBB) induces smooth muscle relaxation and reduces spasm in the gastrointestinal tract and is used during upper gastrointestinal endoscopy and small intestine enteroscopy to reduce contraction and aid mucosal imaging (6). HBB is also used during endoscopic retrograde cholangiopancreatography (ERCP) to facilitate access to the common bile duct during Vater ampulla cannulation (7). Another use of HBB is to optimize mucosal visualization and lesion detection during colonoscopy (8).

In the sleeve gastrectomy operation, due to the traction performed while separating the stomach's large curvature from the short gastric vessels, some patients develop a reactionary spasm in the stomach. In this case, intravenous administration of HBB to patients with excessive spasm is a routine procedure. There might be a difference in the spasm's volume and the resected stomach from the non-spasmed stomach. The planned restrictive procedure in the spasm stomach tissue will probably be insufficient. This will cause the patient not to lose weight at the desired rate and to once again gain weight after a certain period.

For these reasons, gastrectomy was compared cases with removed gastric resection volumes using HBB and those not using HBB during the sleeve. In this study, we address whether we can increase the amount of residual gastric tissue removed during the operation by preventing spasm in gastric smooth muscles.

MATERIAL and METHODS

Patients who underwent LSG due to morbid obesity in the General Surgery Clinic of Keçiören Training and Research Hospital (KEAH) between January 2018 and December 2019 were analyzed. After the ethics committee's approval, data from the files and computer records of our patients

were retrospectively scanned. All patients with a BMI of 40 kg/m² or 35 kg/m² and at least one obesity-related condition were eligible for the trial, according to the National Institute of Health. A multidisciplinary team of psychologists, internists, gastroenterologists, and nutritionists reviewed and followed each patient for at least six months after surgery. Written informed consent was obtained from subjects.

A power analysis was calculated using an effect size of 0.8, alpha level set at 0.05, and power set at 0.82, resulting in a sample size of total 60 subjects.

Ninety patients met the inclusion criteria over the time period studied. Twenty-two patients were omitted from the research owing to postoperative problems, and those who did not want to be included, whose data could not be reached, or who didn't come back for follow-up were also excluded. Finally, 67 individuals were analyzed after completing the six-month follow-up. The patients were divided into two different groups, according to the HBB was administered or not. In Group I was enrolled patients were not administered HBB, in Group II patients were administered HBB.

Demographic data of the patients were recorded. Our routine controls were performed in the first and sixth months after sleeve gastrectomy. Therefore, initial BMI, BMI at first month controls, and BMI at sixth-month controls were recorded.

The Laparoscopic Sleeve Gastrectomy Technique and Volume Analysis

All procedures were performed laparoscopically using a five-port technique to preserve 6 cm of antrum and standardization of the stomach tube by using a 34F bougie, as previously reported (9). The cut stomach tissue was removed from the abdomen with the help of an endo bag. During the operation, 20 mg of Hyoscine butylbromide was administered intravenously 10 minutes before the gastric tissue was cut with the aid of a stapler to the study group. The volume of the removed gastric tissue was calculated by a blind physician who did not know to which group the patient belonged, by making a 1 cm incision from the pyloric part of the stomach tissue. Distilled water was used in the calculation. On the 3rd postoperative day, methylene blue was given orally to the patients and the drain was followed up and it was determined whether there was a leak. Patients whose leak test was negative were discharged after oral intake was opened. A similar diet program suitable for their weight was applied to all patients by the same dietician. Patients had follow-up controls at one and six months after surgery.

Statistical Analyses

Data analysis was evaluated with IBM SPSS 22.0 for Windows data analysis program. The study was meant to examine two separate clinical entities in a retrospective trial. The normality of the data distribution was determined by the Shapiro-Wilk test. Continued values were presented as a mean standard deviation (SD) or median values and an interquartile range (IQR) of 25%-75%. The non-parametric values were analyzed using the Mann-Whitney U test, and parametric values were analyzed with a student-t test. The Spearman rho correlation coefficient was used to measure correlation. P-value less than 0.05 was considered statistically significant.

RESULTS

Sixty-two of the patients included in the study were female (92.5%), and five were male (7.5%). The mean age of the patients was 39.37 ± 11.2 years (18-63). The patients' mean weight and height were 123.58 ± 16.6 kg (93-178 kg) and 162.6 ± 7.4 cm (151-185 cm), respectively. The median preoperative BMI of all patients was 45.7 kg/m².

A total of eight patients, four from group I and four from group II, underwent laparoscopic cholecystectomy at the same time. Three patients in group I and one patient in group II had asthma. While 10 patients in group I had diabetes mellitus, six patients in group II had diabetes mellitus. 19 patients had hypertension and nine of these patients were in group I. There was no statistical difference between the groups in terms of additional disease ($p=0.345$).

There were 35 patients in Group I and 32 patients in Group II. No statistical difference was found between the groups

regarding age, preoperative kg and preoperative body mass indexes (0.356, 0.839 and 0.980, respectively) (Table 1).

BMI data are presented in Table 2. The median removed gastric volume in groups I and II were 1200 (IQR, 1125-1240) ccs and 1330.5 (IQR, 1229.5-1496) ccs, respectively. More stomach tissue was removed in Group II ($p=0.001$).

Patients who underwent LSG after HBB infusion had a statistically significant better weight loss for 1 month ($p=0.031$). In the 6th month, BMI loss was higher in group II compared to Group I ($p=0.04$). In patients who underwent resection with HBB infusion, RGV increased and accordingly BMI loss increased (Table 2). There was no correlation between RGV and preoperative BMI ($p=0.098$, $r=0.204$).

Anastomotic leakage was observed in one of the participants in the study. Postoperative bleeding occurred in two patients.

DISCUSSION

Here we found that 20 mg HBB used intraoperatively increases the gastric volume removed and subsequent weight loss. LSG surgery can also be performed for patients with a BMI > 55 kg/m² before the duodenal switch (9) and Roux-en-Y Gastric (10) by-pass surgery. In our study, patients who underwent Sleeve gastrectomy were evaluated.

HBB is an anticholinergic drug and prevents spasms by reducing smooth muscles' peristalsis in the gastrointestinal (GI) system. In this way, it prevents stomach and intestinal cramps (11). HBB is also commonly used to temporarily prevent GI movements during GI radiological and endoscopic procedures (12). In this study, our purpose of using HBB was to test whether we can increase the amount of

Table 1: Descriptives Analysis according to preoperative age, weight and BMI between groups.

Parameters	Grup I (n=35)	Grup II (n=32)	Total (n=67)	p value
Age, year \pm SD	38.86 \pm 11.63	39.94 \pm 10.87	39.37 \pm 11.2	0.356*
Preoperative weight Kg, \pm SD	124.34 \pm 17.27	122.75 \pm 16.07	123.58 \pm 16.6	0.839*
Preoperative BMI, median (IQR 25-75)	45.1(41.7 to 48.8)	46.2(41.5 to 50.1)	45.7(39.7 to 67.8)	0.980 ^a

BMI: Body mass index kg/m², SD: Standard deviation, Kg: Kilogram, IQR: Interquartile range, n: Number of patients.

*Student-T test, ^a Mann-Whitney U test.

Table 2: Comparison of RGV and BMI values between groups.

RGV and BMI Values	Grup I (n=35)	Grup II (n=32)	Total (n=67)	p value
RGV cc, median (IQR 25-75)	1200 (1125 to 1240)	1330.5 (1229.5 to 1496)	1224 (1200 to 1450)	0.001*
1st Month BMI, median (IQR 25-75)	41.5 (37.9 to 44.9)	39.9 (34.7 to 43.5)	40.6 (36.7 to 44.2)	0.031*
6th Mouth BMI, median (IQR 25-75)	33.9 (30.8 to 37.8)	30.4 (25.4 to 34.6)	32.3 (29 to 35)	0.004*

BMI: Body mass index kg/m², RGV: Removed gastric volume cc, IQR: Interquartile range, n: Number of patients.

*Mann-Whitney U test.

residual gastric tissue removed during the operation by preventing spasm in gastric smooth muscles. As a result of the statistical analysis made, both the gastric volume removed and BMIs were lower in patients using HBB than the control group.

Many studies have investigated the optimum amount of stomach tissue to be removed during LSG. Weiner et al. concluded that calculating the gastric tissue removed in his study was easier than calculating the volume of the remaining gastric tissue, and also that the targeted reduction in BMI was better achieved as the gastric tissue removed increased (13). This could be applied easily with the pure water method used for measurement.

In a similar study, gastric volume was measured by gastric computed tomography volumetry (14). However, this method can increase costs and radiation damage to patients. Calculation of the volume extracted by filling the residual stomach tissue with an incompressible substance, such as water, is an easy and inexpensive method.

Dequines et al. (14) showed that the increased gastric volume was negatively correlated with weight loss, and they evaluated the residual volume below 250 ccs as failed. In the mentioned study, measurements were made with computed tomography. The stomach tissue removed in our study was not examined. The stomach volume, which is an easier method, was examined.

Sista et al. (15) concluded that RGV is the only parameter significantly associated with Type 2 Diabetes Mellitus. This result further increases the importance of the extracted tissue. Du et al. (16) tested the relationship between LSG with weight loss, and found that the weight loss effect 1 year after LSG was not associated with RGV in this Chinese population and that RGV was affected by weight and BMI. There was no difference between the mean BMIs of our patients. Therefore, the decrease in RGV and BMI showed a positive correlation in our study.

Our study's limitation was that we did not calculate the residual stomach volume, which might yield interesting results. We also believe that the number of patients included in our study is low. The strengths of our study are that the method we use is easily applicable and cheap, a single surgeon operates, and the results are statistically strong.

In conclusion, we have identified an inexpensive and readily available drug that can be added to routine LSG procedures.

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Authorship Contributions

Conception and design, analysis and interpretation of data, article drafting, and accountability for all aspects of the work: **Veysel Barış Turhan**, acquisition of data, article drafting: **Abdulkadir Ünsal**, analysis and interpretation of data, article drafting, and conception and design: **Mutlu Şahin**, critical review, final approval of the version to be published, accountability for all aspects of the work: **Hakan Buluş**.

Conflicts of Interest

No competing financial interests exist.

Financial Disclosure

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Ethical Approval

Approval dated 22.01.2020 and numbered 2011-KAEK-15/2047 was obtained from the Clinical Research Ethics Committee of Health Sciences University Keçiören Training and Research Hospital.

Peer-Review Process

Extremely peer-reviewed and accepted.

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