Robotic Sleeve Gastrectomy for Morbid Obesity
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ABSTRACT
Objective: To determine the weight loss, and complications as well as to exemplify the use of vessel sealer and the triple stapler establish the safety and efficacy of vessel sealer for robotic surgery and triple stapler in robotic sleeve gastrectomy.

Study Design: Observational case series.

Place and Duration of Study: Private Koru Hospital, Ankara, Turkey, from December 2015 till January 2016.

Methodology: Twenty robotic sleeve gastrectomy was performed. Demographics, body mass index, comorbidities, docking time, surgical time, leaks, bleeding, stapler number, strictures, mortality, conversion, weight loss, and hospital length of stay were included for data collection.

Results: The mean age and body mass index were 40.73 ±11.2 years and 44.75 ±8.38 Kg/m², respectively. Postoperative trocar site (assistance port) bleeding occurred in one patient. There were no conversions, stricture, leakage or mortality. The mean number of staples used was 6.27 ±0.46 and excess body weight loss (EWL%) at three months was 24.91 ±2.84 kg.

Conclusion: Robotic surgery for obesity surgery was safe during our initial experience and use of vessel sealer and triple stapler was effective, safe and facilitates procedure in obese patients.


INTRODUCTION
Obese individuals are at increased risk of mortality and cardiovascular disease compared to healthy normal weight individuals.1 In recent years, obesity has increased in developed and developing countries.2-4 In the MONICA study, obesity prevalence increased between 10-30% within 10 years.5 Turkish people suffer from the same problem. Defining body mass index (BMI) 30 kg/m² as obesity, one-fourth of the Turkish men over 30 years of age (25.2%) and nearly half of the women (44.2%) were determined as obese. Obesity prevalence was raised with time being 12.5 % in 1990 among similar ages, it doubled up in men; and while the prevalence was less than 40%, it raised to 50%.6

Today, bariatric surgery is the fastest-growing option for weight loss in North America, Europe, and Asia. Studies have shown that compared to other bariatric procedures like gastric banding or gastric bypass, similar weight loss was achieved with sleeve gastrectomy (SG).7,8 Robotic Sleeve Gastrectomy (RSG) is reported to be at least as safe and effective as the laparoscopic sleeve gastrectomy (LSG).9,10

In this study, the objective was to determine the effectiveness of RSG, as well as to establish the safety and efficacy of vessel sealer for robotic surgery and triple stapler in RSG.

METHODOLOGY
Between December 2015 and January 2016, the same console (BE) surgeon and first assistant (MG) performed 20 RSG for the treatment of morbid obesity at. Prospectively prepared standard forms were evaluated. The demographic characteristics, BMI, comorbidities, docking time, surgical time, leaks, bleeding, stapler number, strictures, mortality, conversion, excess body weight loss (EWL), and hospital length of stay were recorded. All patients were preoperatively evaluated by endocrinologist, psychologist, dietician, and anesthetist. Veress needle inserted to establish pneumoperitoneum through the umbilicus. A 8-millimetre (mm) port was gently inserted through the umblicus for camera access. After abdominal visualisation, three 8-mm ports and a 12-mm assistant port were inserted (Figure 1). The distance between the ports was at least 8 centimeters (cm), to avoid sword fight. The pylorus was identified as a first step. Dissection was started approximately 4-6 cm proximal to the pylorus and continued cephalic toward the angle of His. A liver retractor was not needed usually (Figure 2). When the stomach was well mobilized, the anesthesiologist inserted a 32-36 Fr orogastric tube which was used to form gastric sleeve. The assistant surgeon inserted a stapler loaded with tri-stapler (Covidien's Tri-Staple®) in order to divide the sleeve. As the final step, the anesthesiologist inserted a nasogastric (NG) tube after removing the 32-36 Fr orogastric tube. The staple lines checked for bleeding and leakage by the magnified 3D vision system. Peroperative endoscopy or methylene blue to detect possible leakage or hemorrhage, was not employed; instead contrast radiography of the upper gastrointestinal tract in all patients before the patients started
liquid and semiliquid diet (Figure 3). Postoperatively, the patients were evaluated every 3 months by a dietician. For statistical analysis, the statistical software package SPSS® 11.0 for Windows® (SPSS Inc., Chicago, IL) was used. The results were expressed as mean ± standard deviations for continuous variables and frequency with percentages for categorical variables.

**RESULTS**

RSG was performed in 20 patients, of whom 17 (85%) were females and 3 (15%) males. The mean age and mean BMI were 40.73 ±11.2 years and 44.75 ±8.38 Kg/m², respectively. Five patients had diabetes, two each had hypertension and sleep apnea, two had diabetes and hypertension, and one had dyslipidemia. Postoperative trocar site (assistance port) bleeding occurred in one patient, and it required surgical hemostasis. There were no conversions, stricture, leakage or mortality. Mean EWL% at 3 months was 24.91 ±2.84 Kg. The mean number of staplers used was 6.27 ±0.46. The mean lenght of hospital stay was 5 days. Two patients (10%) needed bridectomy for upper abdominal visualization. Robotic cholecystectomy was also done in one patient who had symptomatic cholelithiasis. The mean docking time and mean time for SG were 4.55 ±0.68 minutes and 50.36 ±8.61 (range 40-65) minutes, respectively (Table I).

**DISCUSSION**

Obesity has become an important public health problem worldwide. It may cause chronic conditions such as hypertension, type II diabetes mellitus, cardiovascular disease, steatohepatitis, obstructive sleep apnea, some malignant tumors and depression.

RSG has several advantages over laparoscopic surgery for the treatment of obesity, requiring surgical correction. The recent RSG series have uniformly reported 0 percent leak rates. No leaks were encountered in this series as well. The authors believe that a very low rate of leaks in RSG might be the leading advantage of this operation. The robotic bariatric surgery offers advantages, especially to the surgeon. Compared to laparoscopic surgery, robotic surgery offers the possibility for endowrist in addition to tremor reduction, and these features facilitate hiatal dissection and oversewing of the staple lines. Robotic His angulation dissection is done more easily than laparoscopic surgery, and without assistance. The critical last stapler is applied more safely owing to high visualization.

The presently reported data of docking and operation times were similar to those of previous studies. According to this study, mean EWL was 25% at 3 months. One patient of this series had assistant trocar site bleeding, which required surgical hemostasis. The assistant trocar site has an increased bleeding risk, because this region is superimposed on the inferior epigastric artery (IEA). Trauma to abdominal wall vessels has been reported in 0.2 - 2% of laparoscopic procedures and said to occur in 3 per 1000 cases. IEA is always at risk to be injured as putting trocar insertion after creating pneumoperitoneum is relatively blind. The authors recommend examination of trocar site for bleeding after removal.

This study results are limited by its study design. It was a retrospective analysis of data involving 20 patients. So these results need to be confirmed on larger number of patients with prospective data collection and analysis.

**CONCLUSION**

The robotic surgery for obesity surgery was safe during our initial experience and use of vessel sealer and triple stapler was effective, safe and facilitates procedures in obese patients. More studies will be needed for further data.
REFERENCES